

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-076-1(9)	2006	84	160

GENERAL TRAFFIC SIGNAL NOTES:

- All Traffic Signal work shall conform to the requirements of the Manual on Uniform Traffic Control Devices for Streets and Highways, U.S. Department of Transportation, Federal Highways Administration, Latest Edition, and Amendments.
- The locations of the traffic signal standards, traffic signal standards with mast arm, pedestrian push buttons, traffic controller, transformer, pullboxes, conduits, & loop detectors shall be staked out in the field by the Contractor and locations accepted by the Engineer prior to construction and installation. Locations shown on plans shall be adjusted as necessary to prevent conflict with existing or new facilities.
- All direct-buried conduits shall be PVC Schedule 80.
- Loop detectors shall be installed according to Loop Detector Details shown on the Plans.
- Lead-in wires in pullbox near loops shall be tagged with Loop Number(s).
- Existing pavement shall be restored according to Restoration of Existing Pavement due to Trench Excavation detail shown on the Plans.
- Steel plates for covering trenches shall have skid resistant surface.
- All structures, pavements, utilities, landscaping, and other topographical features shown on the Plans are existing and shall remain unless noted or indicated otherwise. All grassed areas damaged by construction activities shall be top soiled and grassed.
- A solid #8 bare copper wire shall be pulled in all conduits with the traffic control cable for equipment ground.
- All splicing shall be done in the pullboxes.
- All traffic signal controller equipment shall be completely wired in the cabinet and shall control the traffic signal as called for in the Plans.
- The loop amplifier units furnished for this project shall be capable of operating the loop detector configurations shown on the Plans.
- A 3'x5' level area shall be provided along side pedestrian push button assemblies at a distance not to exceed 10'-0".
- The Contractor shall verify with the respective utility companies and government agencies, the locations of all electric, telephone, traffic signal, street light, cable television, fire alarm, gas, water, sewer, drain and other lines crossing the excavation path or in excavation areas.
- All work and materials for the traffic signal system shall conform to Special Provisions Section 623 - Traffic Signal System, except as otherwise provided on the Plans.
- Provide ground rod in all pullboxes, pullboxes adjacent to signal standards, pedestals, controller cabinets, and other locations ordered by the Engineer. Ground rod connectors shall be copper welded and shall meet ground to earth resistance as specified by the National Electric Code or local inspecting agency.

- Underground pipes, cables, or ductlines known to exist are indicated on the Plans. The Contractor shall verify the locations and depths of the facilities and exercise proper care in excavating in the area. Wherever connections of new utilities to existing utilities are shown on the Plans, the Contractor shall expose the existing lines at the proposed connections to verify their locations and depths prior to excavation for the new lines.
- During non-working hours, the Contractor shall provide two lanes for through traffic. On streets too narrow to make this practicable, the Contractor may work in one half of the roadway keeping one lane open to traffic and alternating the flow of traffic. During non-working hours, all trenches shall be covered with a safe, non-skid, traffic-bearing bridging material and all lanes shall be open to traffic.
- Where pedestrian walkways exist, they shall be maintained in passable condition or other facilities for pedestrians shall be provided. Passage between walkways at intersections shall likewise be provided.
- Driveways shall be kept open unless the owners of the property using these rights-of-way are otherwise provided for satisfactorily.
- No material and/or equipment shall be stockpiled or otherwise stored within street rights-of-way except at locations designated in writing and accepted by the Engineer.
- Traffic Signal Supports and Foundations shall meet the requirements of "AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 4th Edition 2001."
- See sheets RI-22 and RI-23 for Trench Restoration Details and Typical Section for Permeable Base Course.

TRAFFIC SIGNAL LEGEND AND ABBREVIATIONS:

	Conduits and Cables, Conduit Run X
	Temporary Microwave Detector
	Temporary Microwave Detector Cable
	12" R-Y-G Traffic Signal Head
	12" R-Y-← Traffic Signal Head
	12" R-Y-↑ Traffic Signal Head
	12" R-Y-→ Traffic Signal Head
	12" R-Y-←-→ Traffic Signal Head
	Pedestrian Signal Head
	Pedestrian Push Button Assembly (Arrow denotes direction on Push Button Sign)
	Emergency Vehicle Preempt Receiver (Opticom Receiver)
	Signal Standard with Mast Arm Type II, or Type III L=Length of Mast arm, Pole X, Footing Type C
	Signal Standard Type I (H=3', 7' or 10') or Type III
	Loop Detectors
	Pullbox Type A (Old Type "B")
	Pullbox Type B (Old Type "C")
	Pullbox Type C (Old Type "D")
	Traffic Controller Model 170E and 332A Cabinet with Type D Concrete Base for Controller Cabinet
	Street Sign Mounted to Mast Arm

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16/FORT WEAVER ROAD/TSI-1/TS-NOTES.dgn

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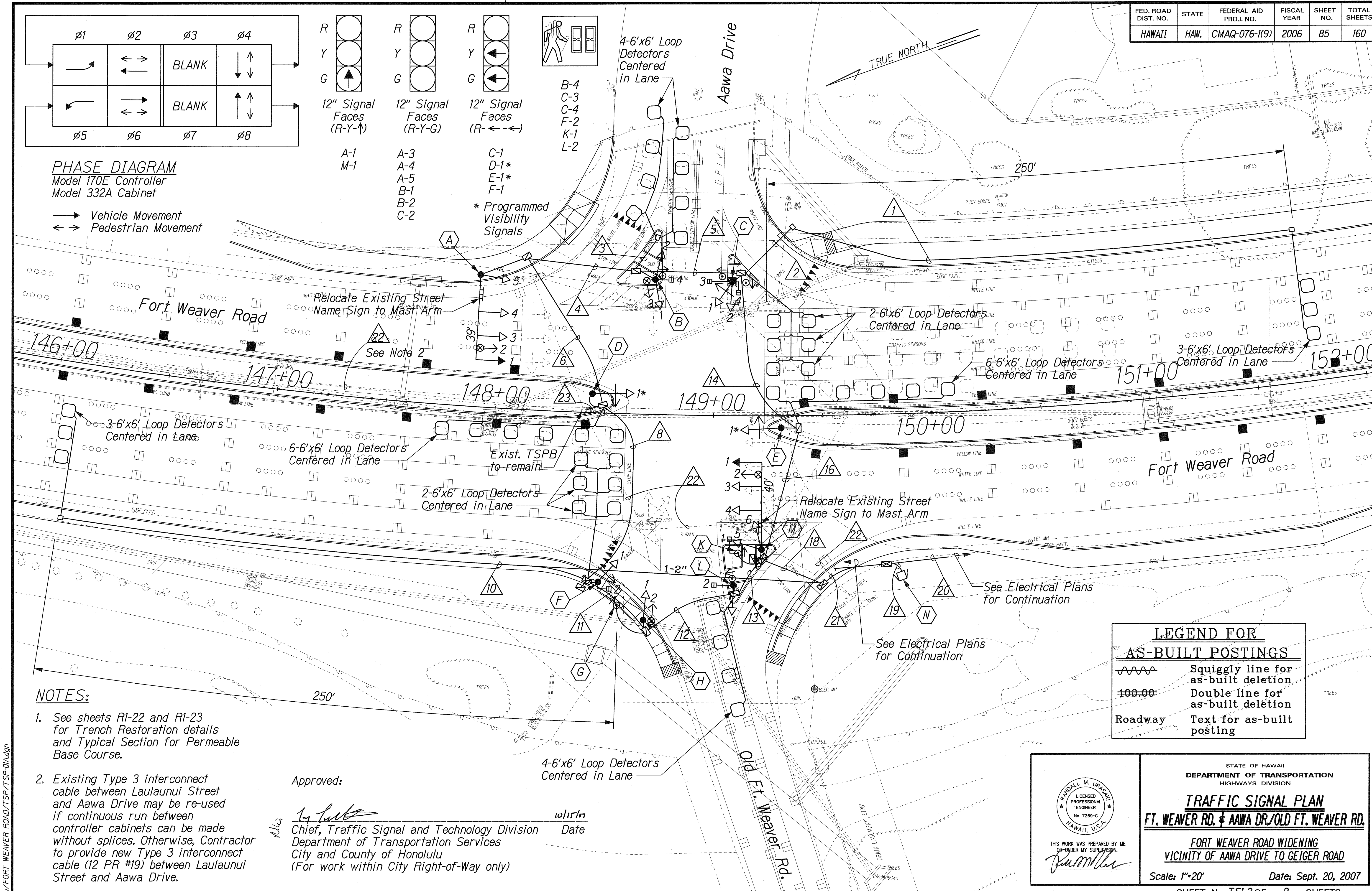
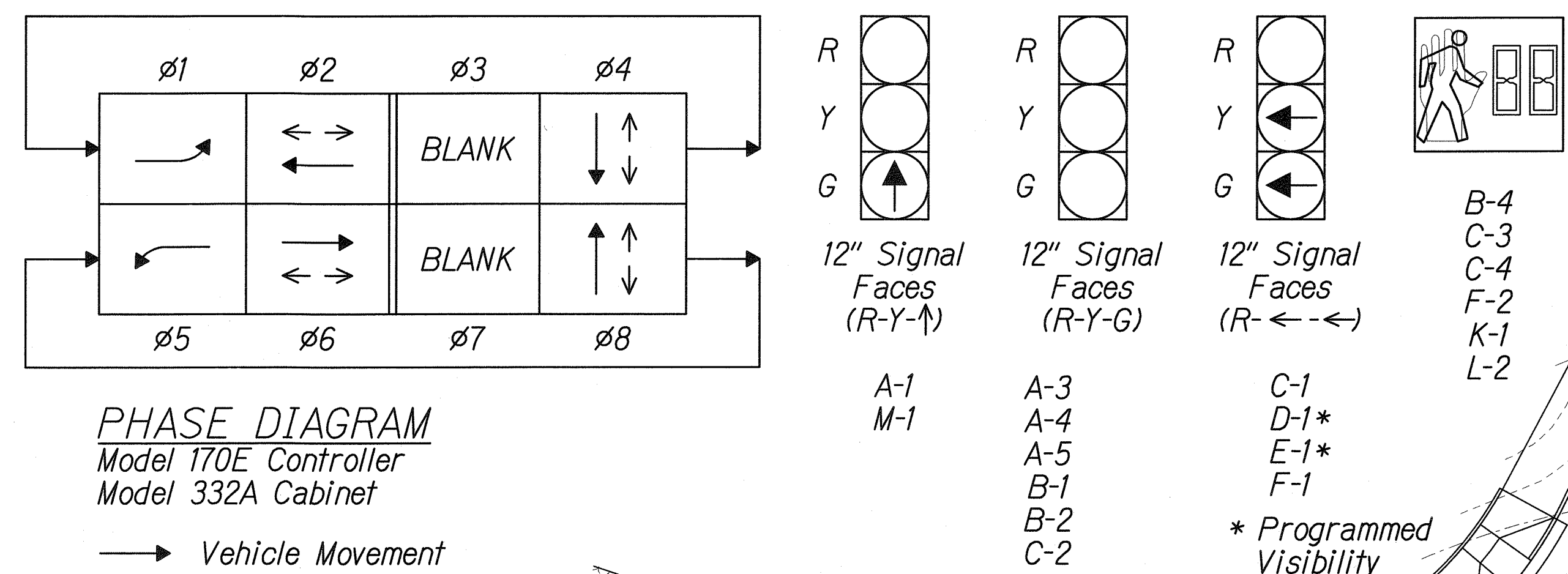
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**TRAFFIC SIGNAL PLAN
NOTES AND LEGEND**

FORT WEAVER ROAD WIDENING
VICINITY OF AAWA DRIVE TO GEIGER ROAD

Scale: Not to Scale Date: Sept. 20, 2007

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-076-1(9)	2006	85	160



- NOTES:**
- See sheets R1-22 and R1-23 for Trench Restoration details and Typical Section for Permeable Base Course.
 - Existing Type 3 interconnect cable between Laulaunui Street and Aawa Drive may be re-used if continuous run between controller cabinets can be made without splices. Otherwise, Contractor to provide new Type 3 interconnect cable (12 PR #19) between Laulaunui Street and Aawa Drive.

Approved: *[Signature]* Date: 10/15/17

Chief, Traffic Signal and Technology Division
Department of Transportation Services
City and County of Honolulu
(For work within City Right-of-Way only)

LEGEND FOR AS-BUILT POSTINGS

	Squiggly line for as-built deletion
	Double line for as-built deletion
	Text for as-built posting

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[Signature]

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL PLAN
FT. WEAVER RD. & AAWA DR./OLD FT. WEAVER RD.

FORT WEAVER ROAD WIDENING
VICINITY OF AAWA DRIVE TO GEIGER ROAD

Scale: 1"=20' Date: Sept. 20, 2007

SHEET No. TSI-2 OF 9 SHEETS

ORIGINAL PLAN	DATE
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1/6 FORT WEAVER ROAD/TSP/TSP-014.dgn

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-076-1(9)	2006	86	160

Cable and Conduit Schedule

Run △	Conduit Size	Signal Control 26C#14	PPB/ Loops 2C#14	Opticom 3C#20	Power 3C#6	Inter- connect 12PR#19	Other
1	2"		1				
2	2"		1				
3	2"		2				
4	2"	1					
	3-2"			1			
5	2"	1					
	2"		3				
	2"			2			
	2"						Spare
6	2"	1					
	3-2"						Spare
8	2"	1					
	2"		2				
	2"					1	
	2"						Spare
10	2"						
11	2"	1					
	2"		6				
	2"					1	
	2"						Spare
12	2"	1					
	2"		6				
	2"			1			
	2"					1	
	2-2"						Spare
13	2"	1					
	2"		7				
	2"			1			
	2"					1	
	2-2"						Spare
14	2"	1					
	2"		7				
	2"			2			
	2"						Spare
16	2"	1					
	2"		9				
	2"			2			
	2"						Spare
18	2-2"	2					
	2-2"		16				
	2-2"			4			
	2"					1	
	2"						Spare
19	2-2"	2					
	2-2"		16				
	2-2"			4			
	2"					1	
	2"						Spare
	2-4"					2	

Cable and Conduit Schedule

Run △	Conduit Size	Signal Control 26C#14	PPB/ Loops 2C#14	Opticom 3C#20	Power 3C#6	Inter- connect 12PR#19	Other
20	4"					1	
21	2-2"	2					
	2-2"		16				
	2-2"			4			
	2"				1		
	2"						Spare
	4"					1	
22	Exist. 2"					1	
23	2"					1	

Material List

Pole △	Base Type	Standard Type	Mounting Type	PPB Assembly
A	C	II-39	(1) MA-1W (I)	
			(2) Opticom (Horiz)	
			(3) MA-1W (I)	
			(4) MA-1W (I)	
			(5) B-1W	
B	A	I-10	(1)(2) TP-2W	
			(3) Opticom (Vert)	
			(4) B-1W	1
C	A	I-10	(1)(2) TP-2W	
			(3) US-1W	1
			(4) US-1W	1
D	*	SLP	(1) B-1W	
E	*	SLP	(1) B-1W	
F	A	I-10	(1) TP-1W	
			(2) B-1W	
G	*	SLP		1
H	A	I-10	(1) TP-1W	
			(2) Opticom (Vert)	
K	A	I-10	(1) TP-1W	1
L	A	I-10	(1) TP-1W	
			(2) B-1W	1
M	C	II-40	(1) MA-1W (I)	
			(2) Opticom (Horiz)	
			(3) MA-1W (I)	
			(4) MA-1W (I)	
			(5)(6) B-2W	
N	D		170E Controller	
			332A Cabinet	

* Signal to be mounted on SL Pole.
See Footing Detail on Sht. E1-10.

ORIGINAL PLAN	DATE
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IN CHARGE	

1/4 FORT WEAVER ROAD, TSP/TSP-01B.dgn

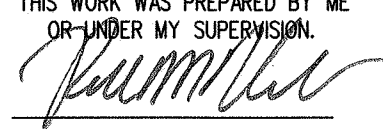
RANDALL M. URASKI

LICENSED
PROFESSIONAL
ENGINEER

No. 7269-C

HAWAII, U.S.A.

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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

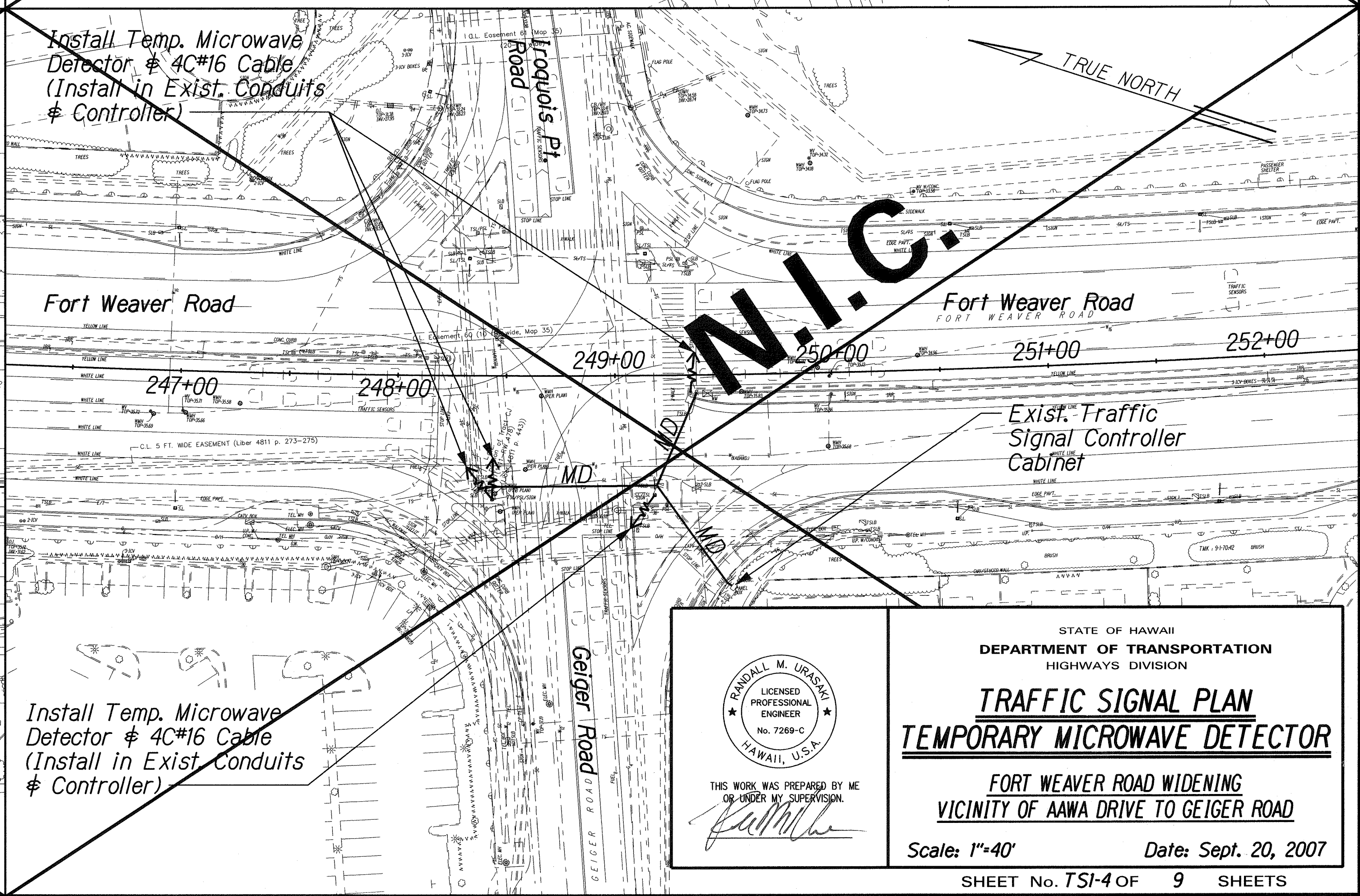
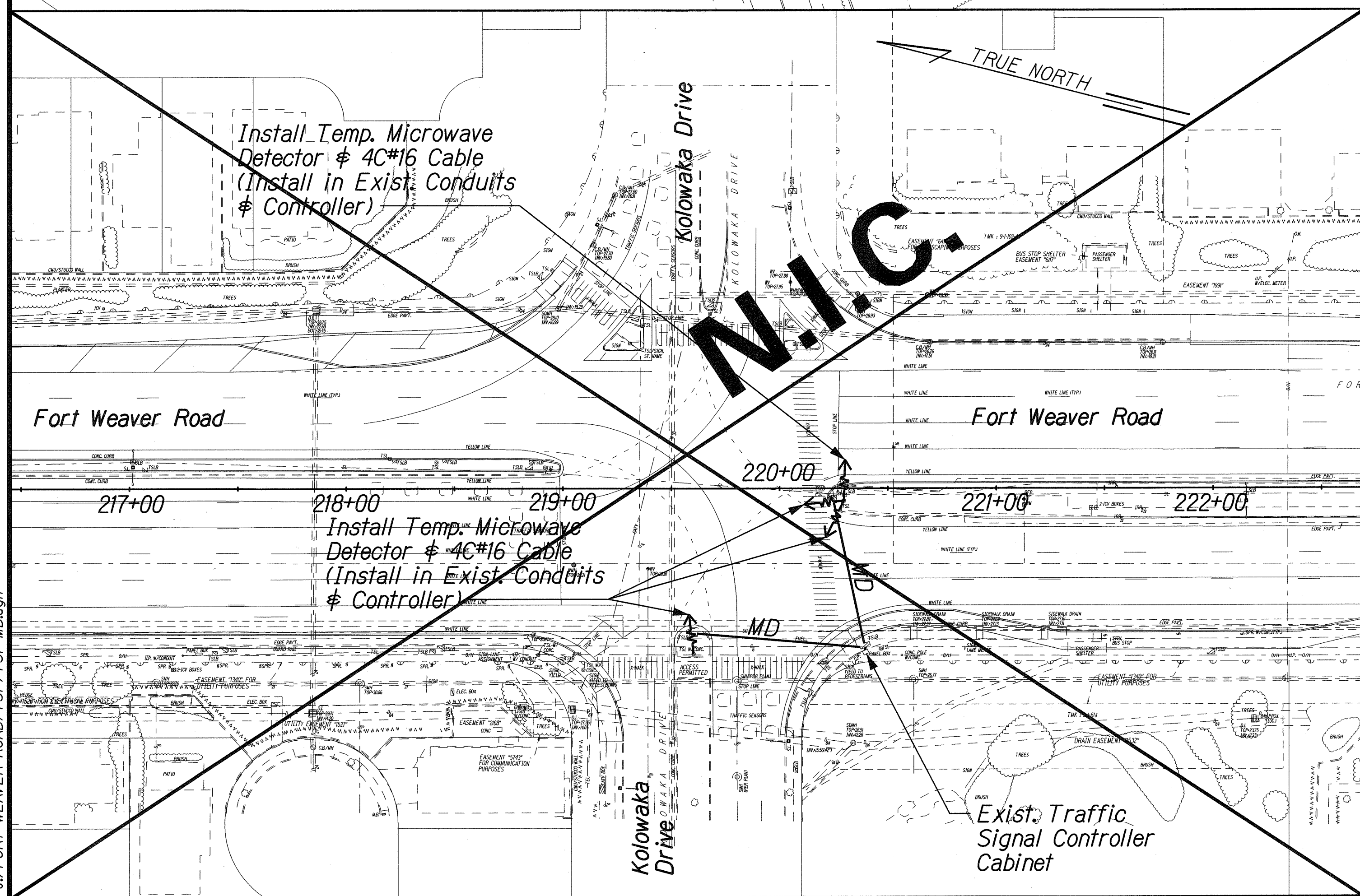
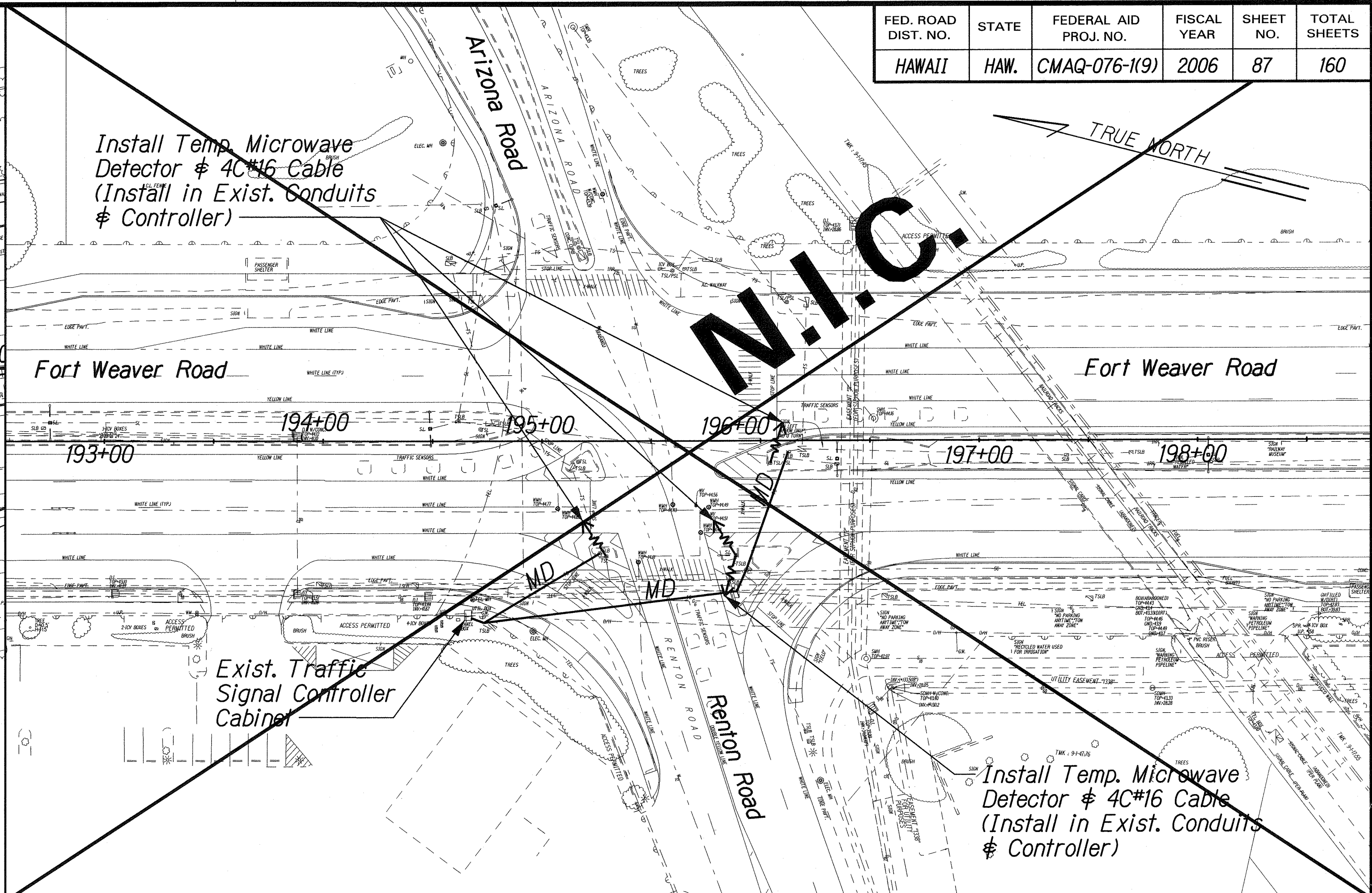
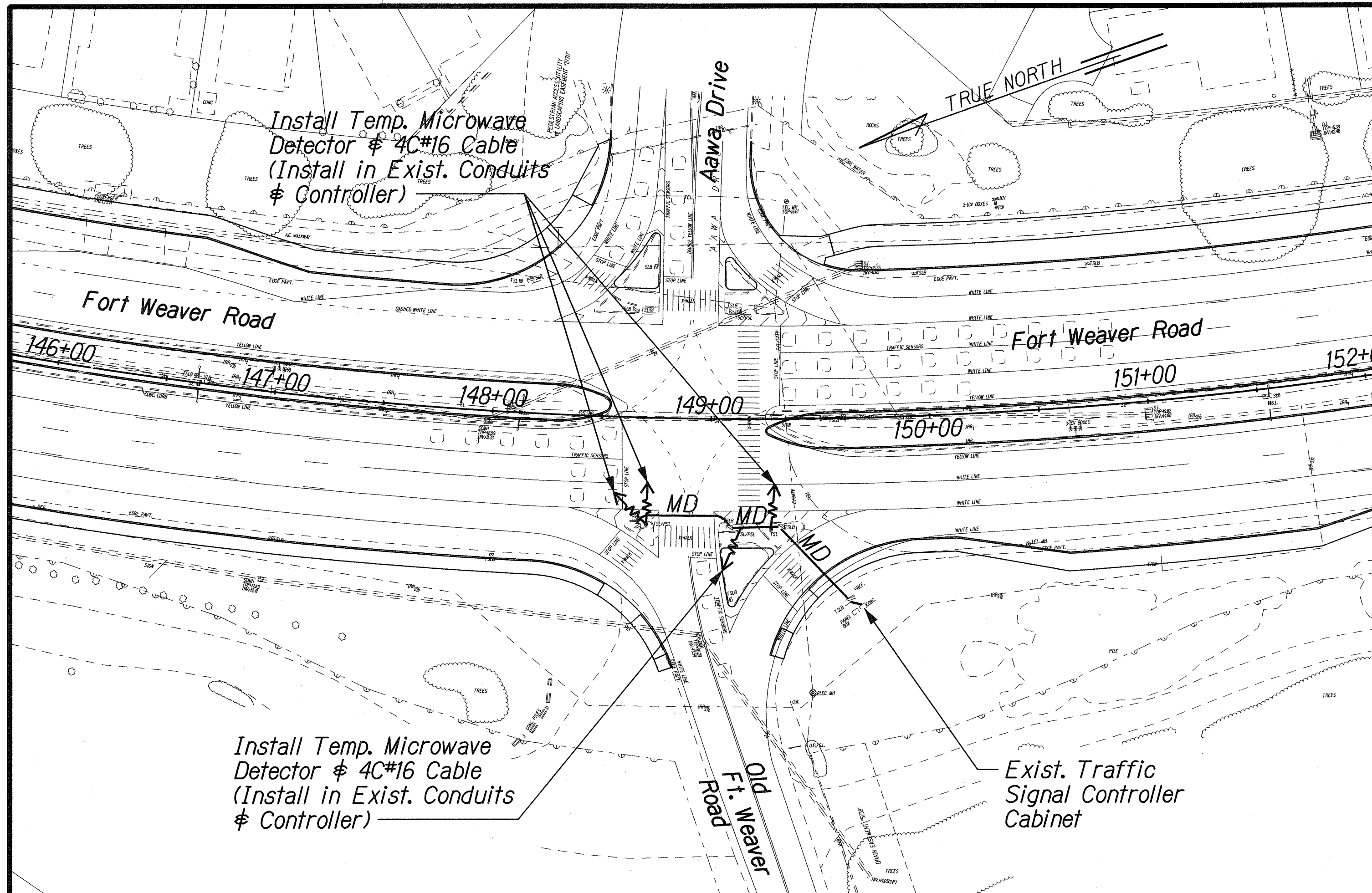
TRAFFIC SIGNAL PLAN

FT. WEAVER RD. & AAWA DR./OLD FT. WEAVER RD.

FORT WEAVER ROAD WIDENING
VICINITY OF AAWA DRIVE TO GEIGER ROAD

Scale: None Date: Sept. 20, 2007

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-076-1(9)	2006	87	160



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1/4" FORT WEAVER ROAD/TSP/TSP-MD.dgn

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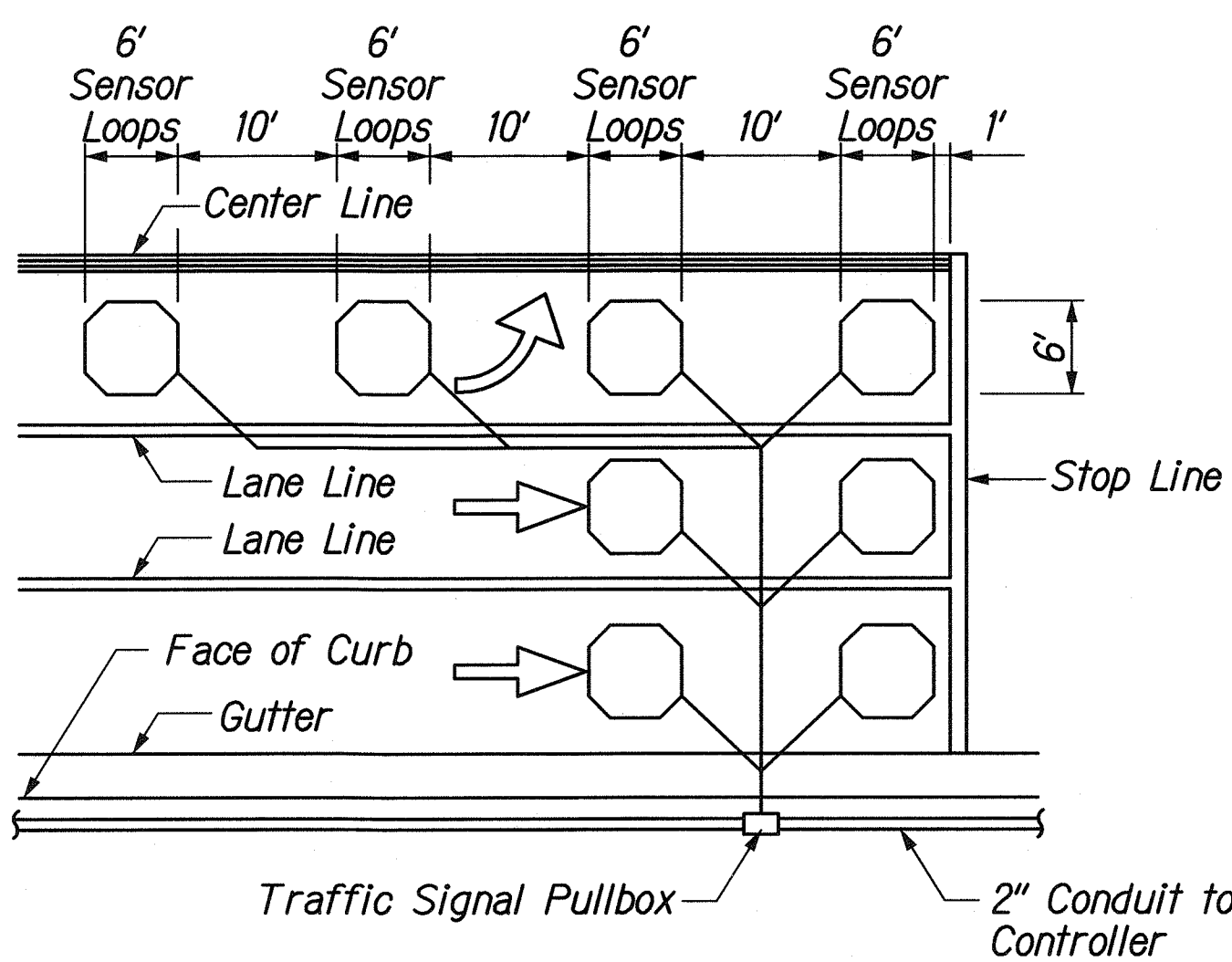
TRAFFIC SIGNAL PLAN
TEMPORARY MICROWAVE DETECTOR

FORT WEAVER ROAD WIDENING
VICINITY OF AAWA DRIVE TO GEIGER ROAD

Scale: 1"=40' Date: Sept. 20, 2007

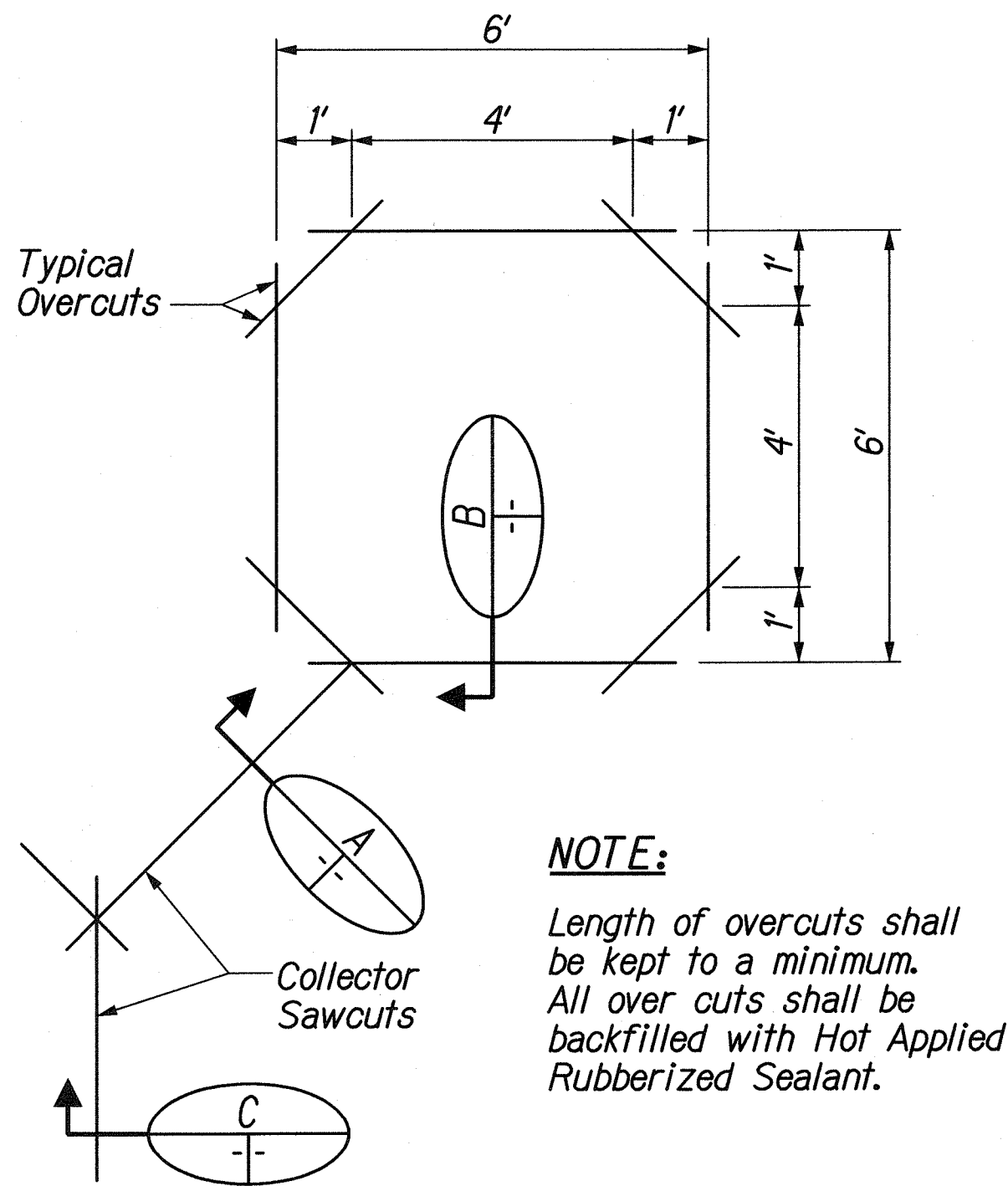
SHEET No. TSI-4 OF 9 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
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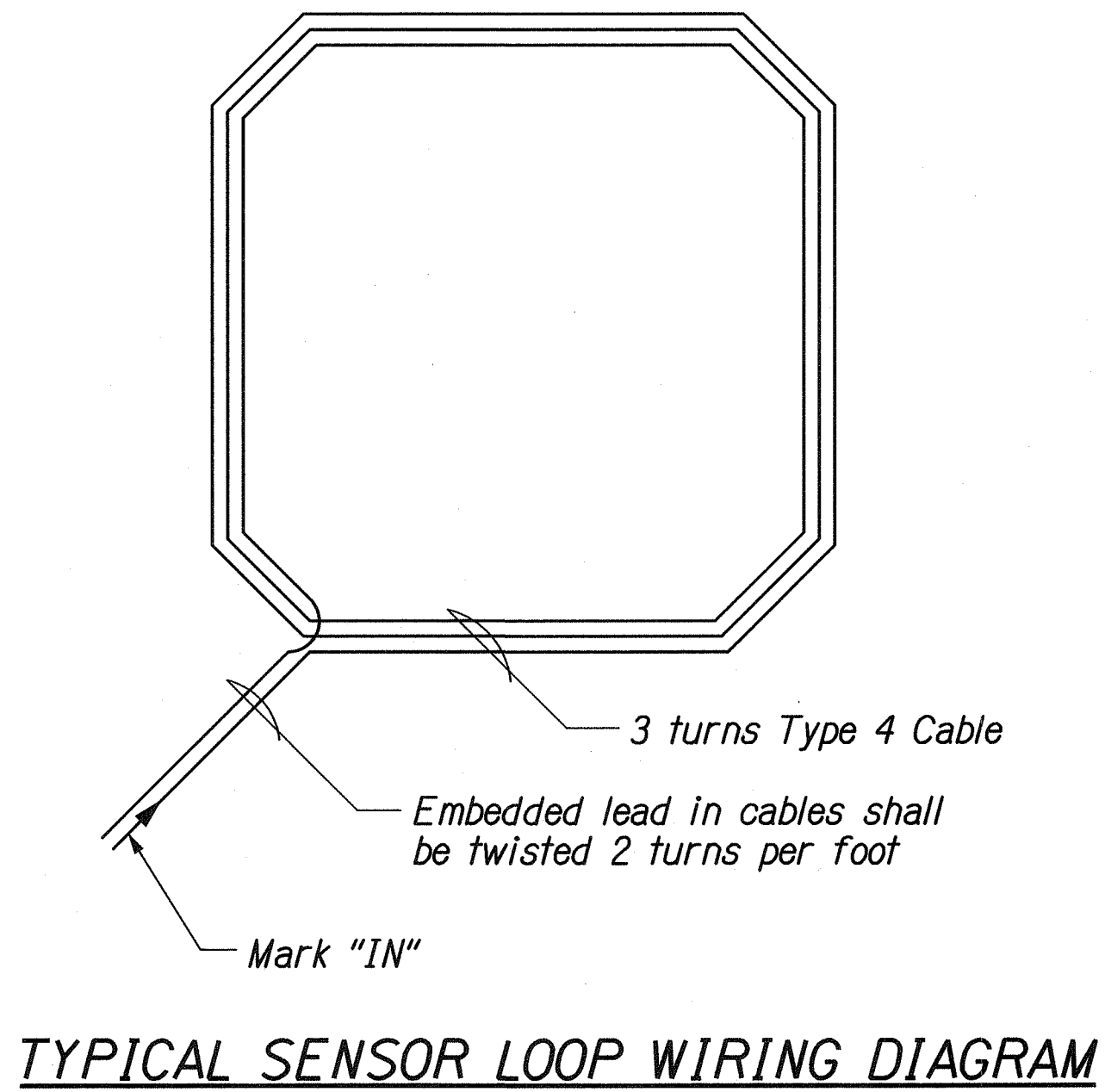


- NOTES:**
- Center sensor loops in lanes.
 - Collector Cables shall be twisted 2 turns per foot.
 - Number of loops and locations vary. See project plans.
 - Number and locations of Collector Sawcuts may be varied in the field.

TYPICAL SENSOR LOOP LAYOUT

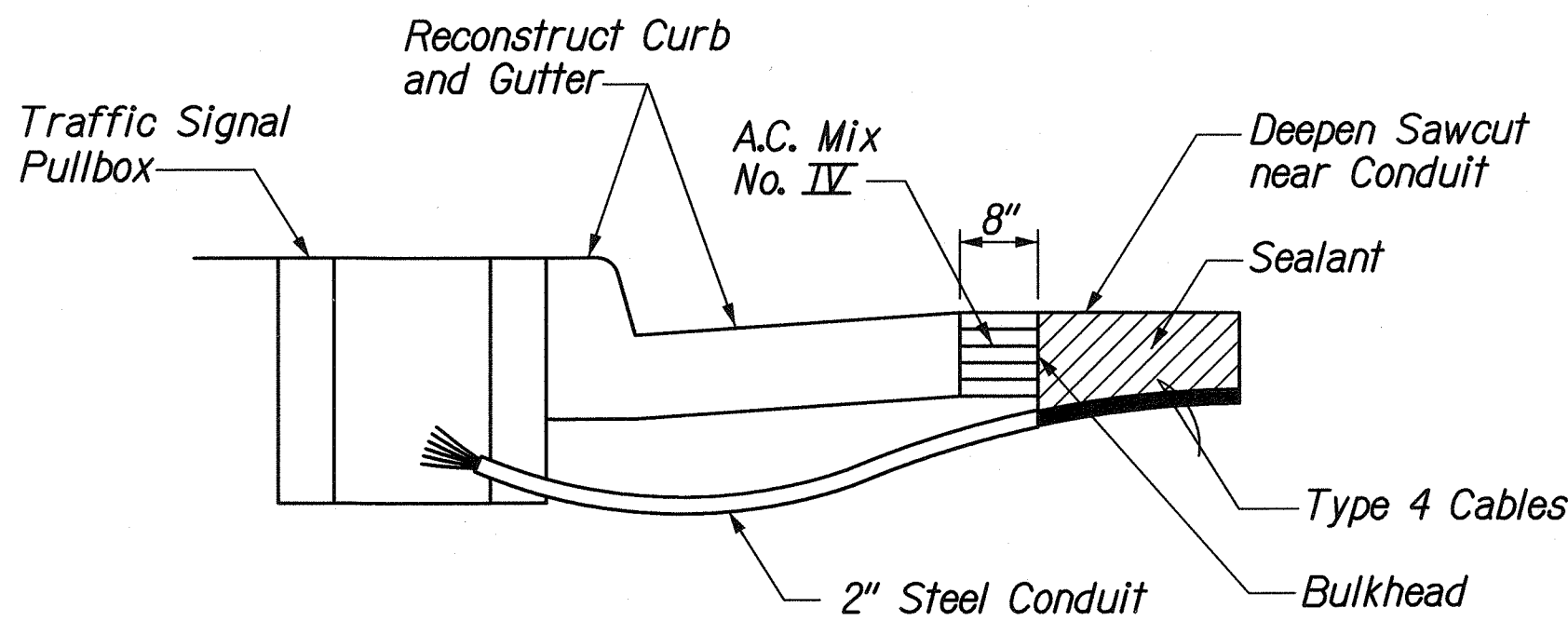


TYPICAL SENSOR LOOP SAWCUT DETAIL



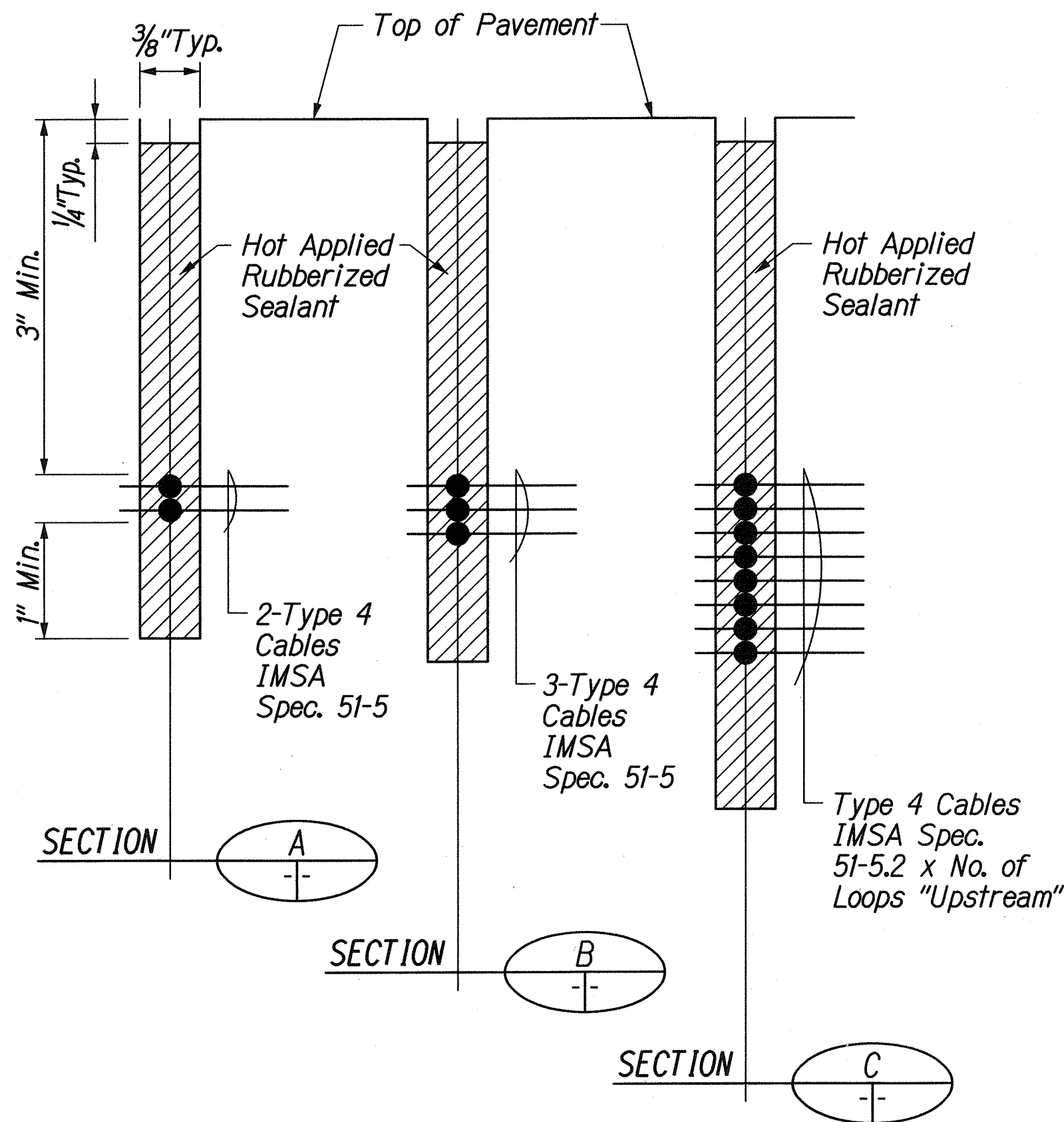
TYPES OF CABLES

- Type 1 Signal Loop Cable: Stranded No. 14, 26 conductors
- Type 2 Detector lead in cable and pedestrian push button circuit cable: Stranded, No. 14, two conductors
- Type 3 Interconnect Cable: Solid No. 19, 12 pairs
- Type 4 Loop Sensor Cable: Solid No. 12, single conductor to IMSA spec. 51-5
- Type 5 Cable from signal loop to signal head: Stranded, No. 14, four conductors
- Type 6 Service Cable: Solid, No. 6, three conductors
- Type 7 Optical Detector Cable: Berktek Type B, Stranded, No. 20, three conductors
- Type 8 Drop Cable: Solid, No. 14, four conductors



- NOTES ON CONSTRUCTION AT END OF SAWCUT:**
- Seal roadway end of conduit after installation of Conductors.
 - Install Bulkhead across conduit trench.
 - Place Hot Tar in Sawcut.
 - Backfill over conduit with New A.C.
 - Reconstruct Curb and Gutter as required

DETAIL OF SENSOR LOOP INSTALLATION AT EDGE OF PAVEMENT



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R. M. Urasak

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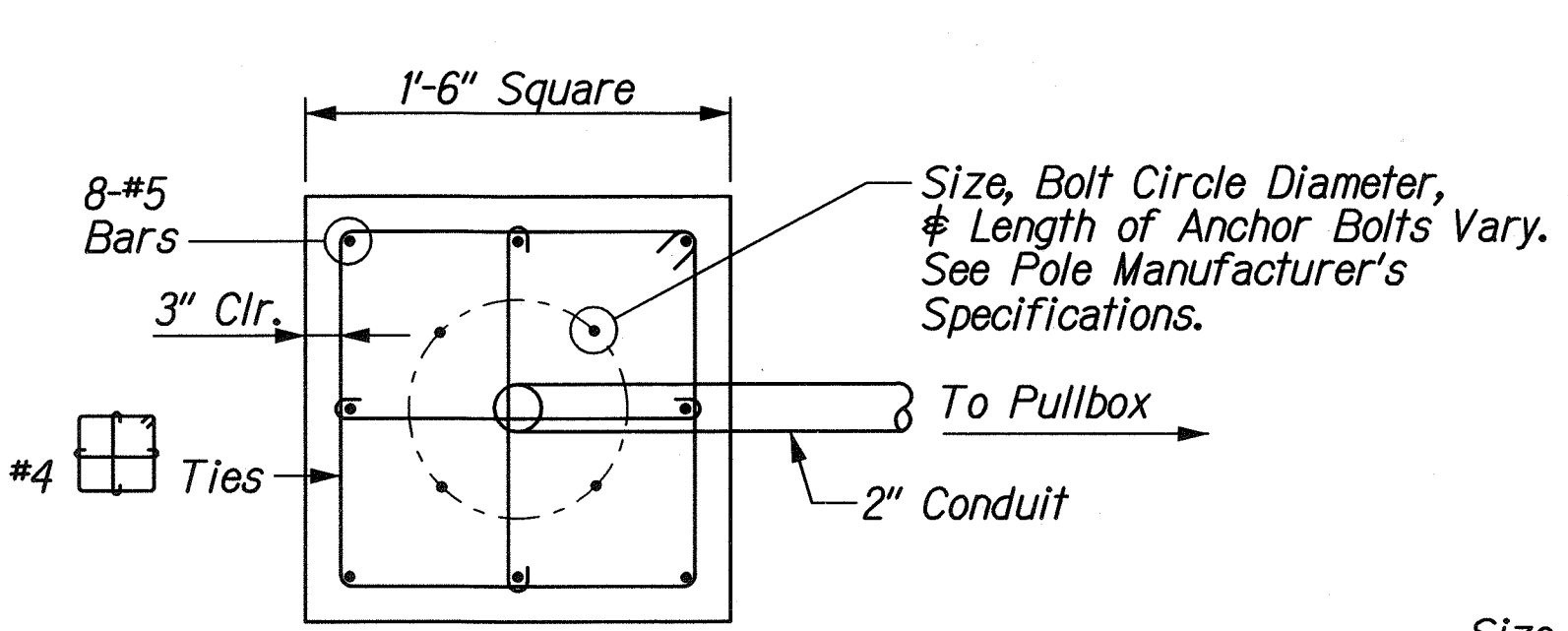
**TRAFFIC SIGNAL PLAN
LOOP DETECTOR DETAILS**

FORT WEAVER ROAD WIDENING
VICINITY OF AAWA DRIVE TO GEIGER ROAD

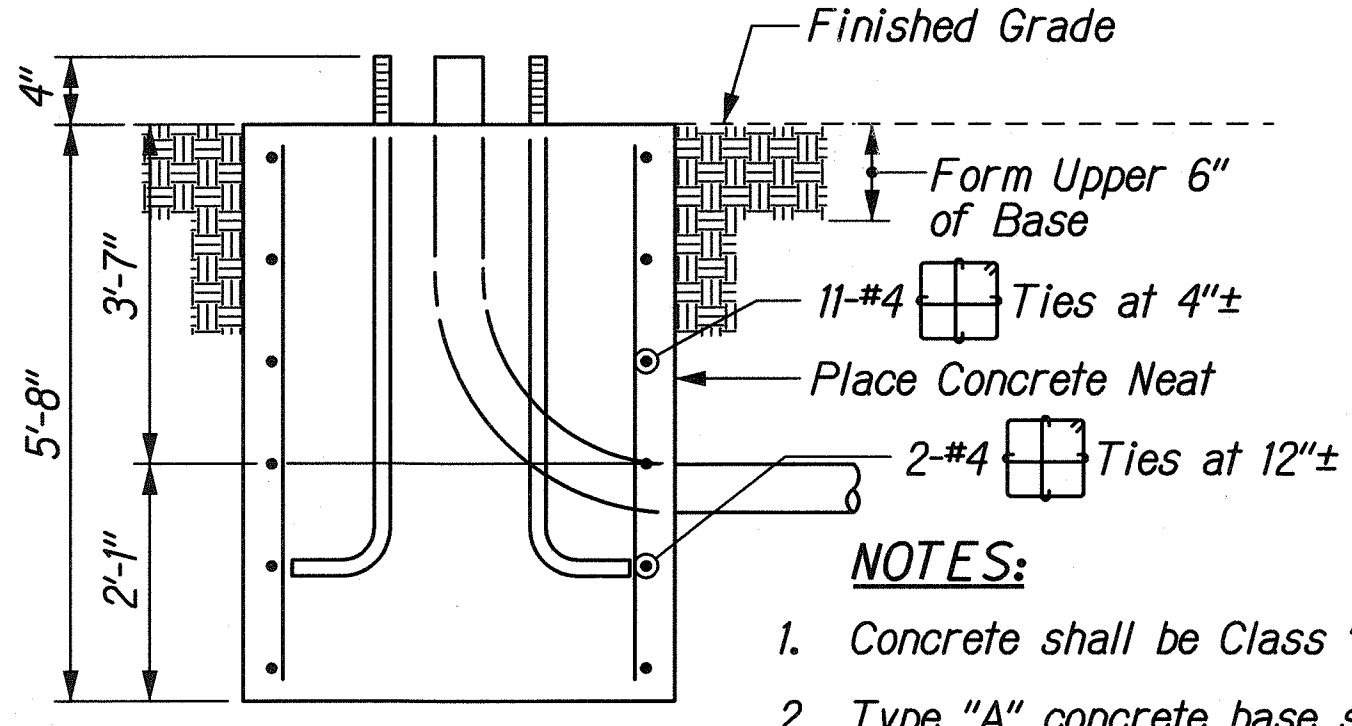
Scale: None Date: Sept. 20, 2007

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1/4 FORT WEAVER ROAD TSI-TS-DET1.dgn



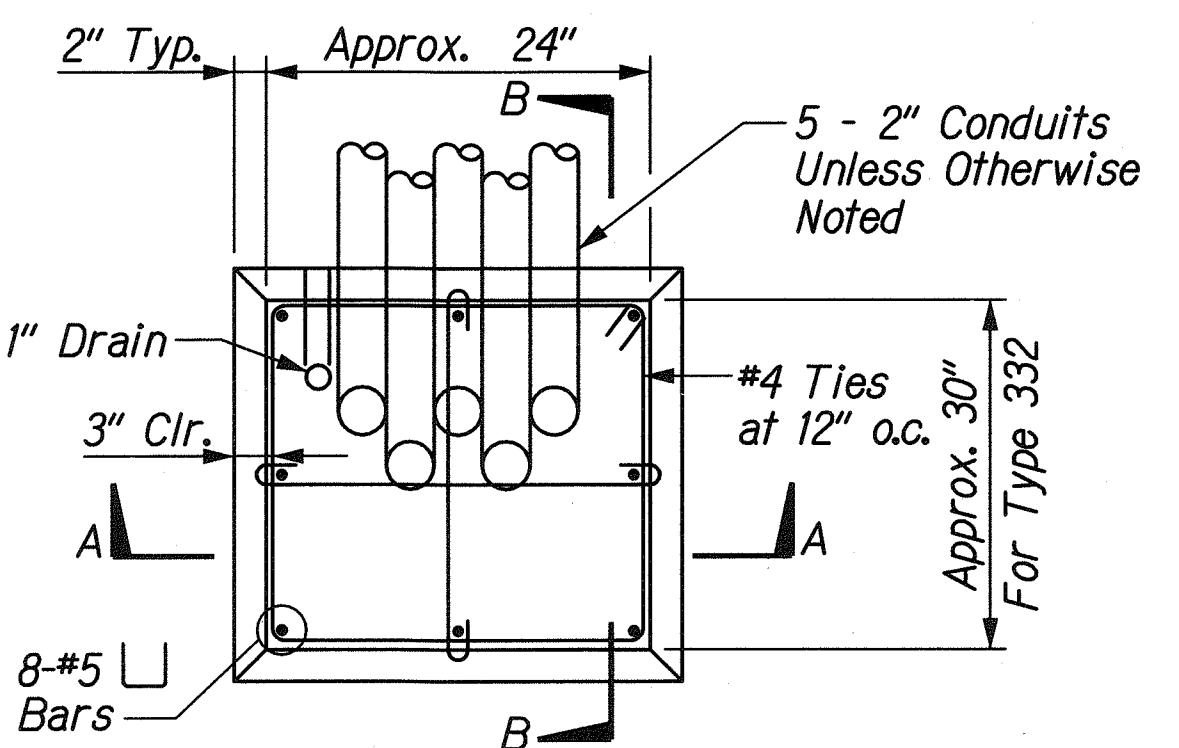
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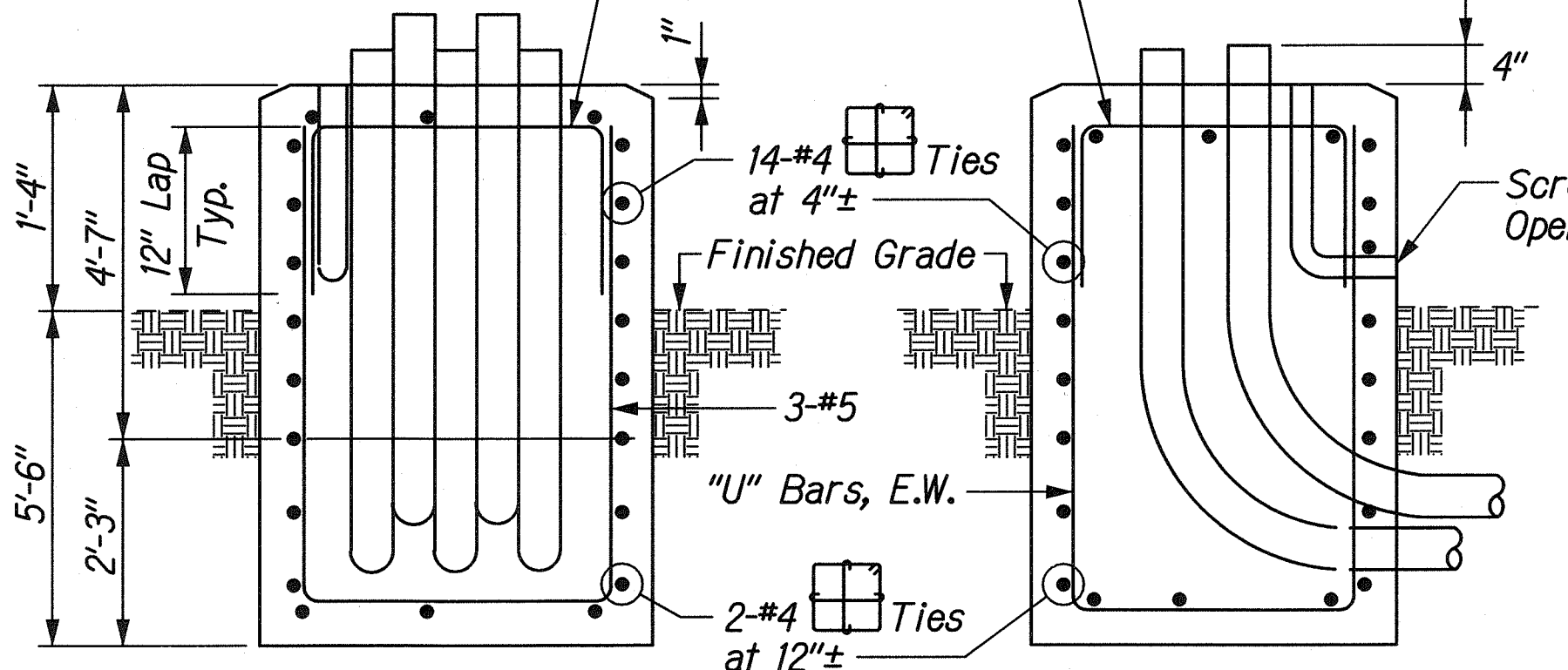
VERTICAL SECTION

TYPE "A" CONCRETE BASE

Not to Scale



PLAN

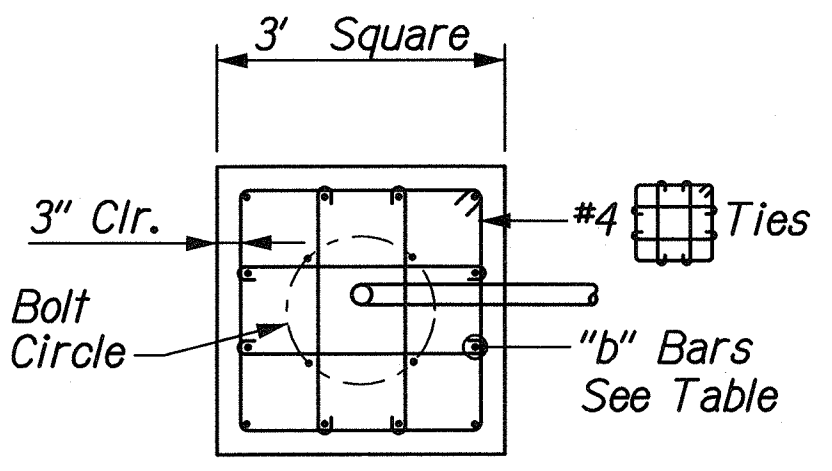


SECTION "A"

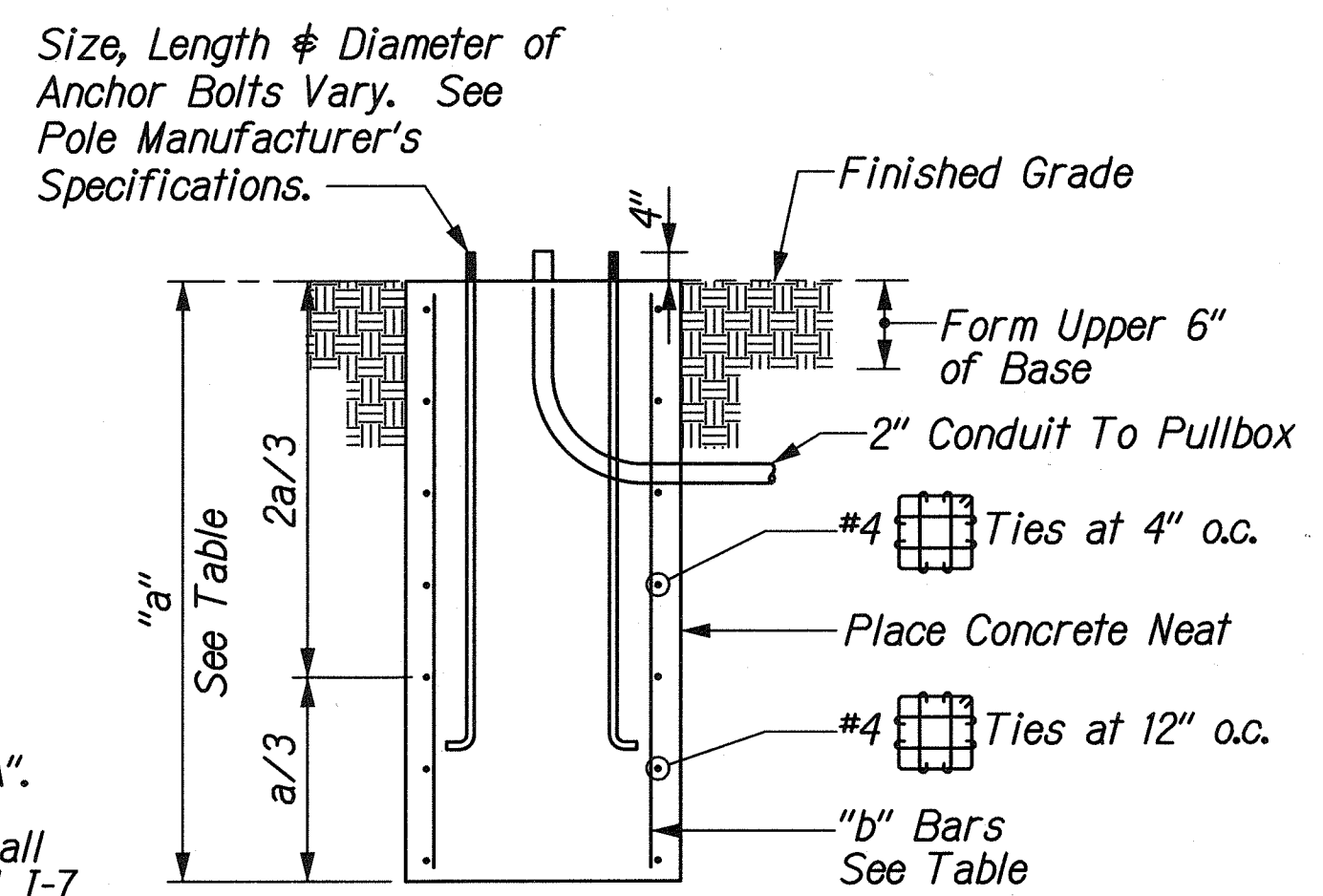
SECTION "B"

TYPE "D" CONC. BASE FOR CONTROLLER CABINETS

Not to Scale



PLAN-SECTION



VERTICAL SECTION

TYPE "C" CONCRETE BASE

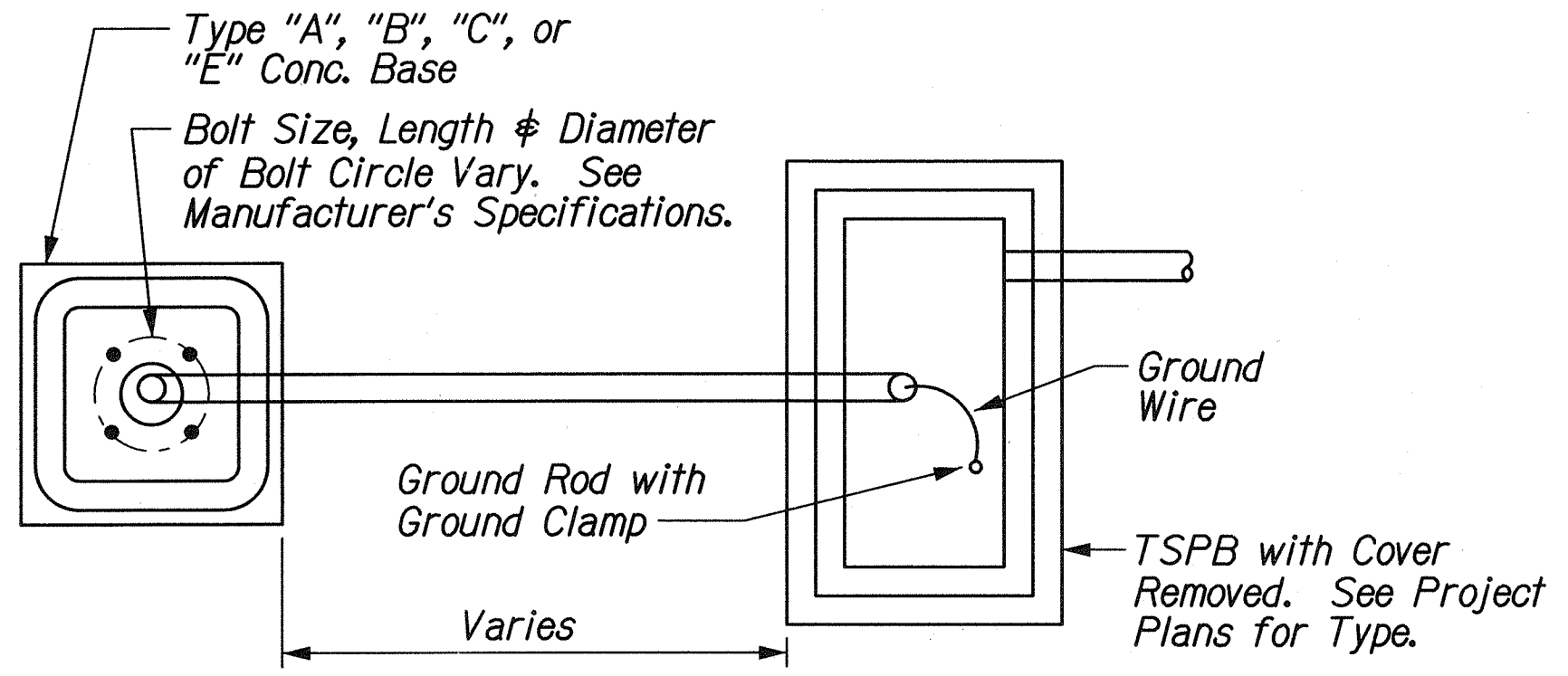
Scale: 1/2 inch = 1 foot 0 inch

TYPE "C" CONCRETE BASE		
TYPE OF STANDARD	"a"	"b" Bars
II - 48	12'-1"	12-#5
II - 47	12'-0"	12-#5
II - 44	11'-9"	12-#5
II - 43	11'-8"	12-#5
II - 40	11'-6"	12-#5
II - 39	11'-5"	12-#5
II - 37	11'-3"	12-#5
II - 34	11'-0"	12-#5
II - 31	10'-9"	12-#5
II - 29	10'-8"	12-#5
II - 24	10'-3"	12-#5
II - 13	9'-7"	12-#5

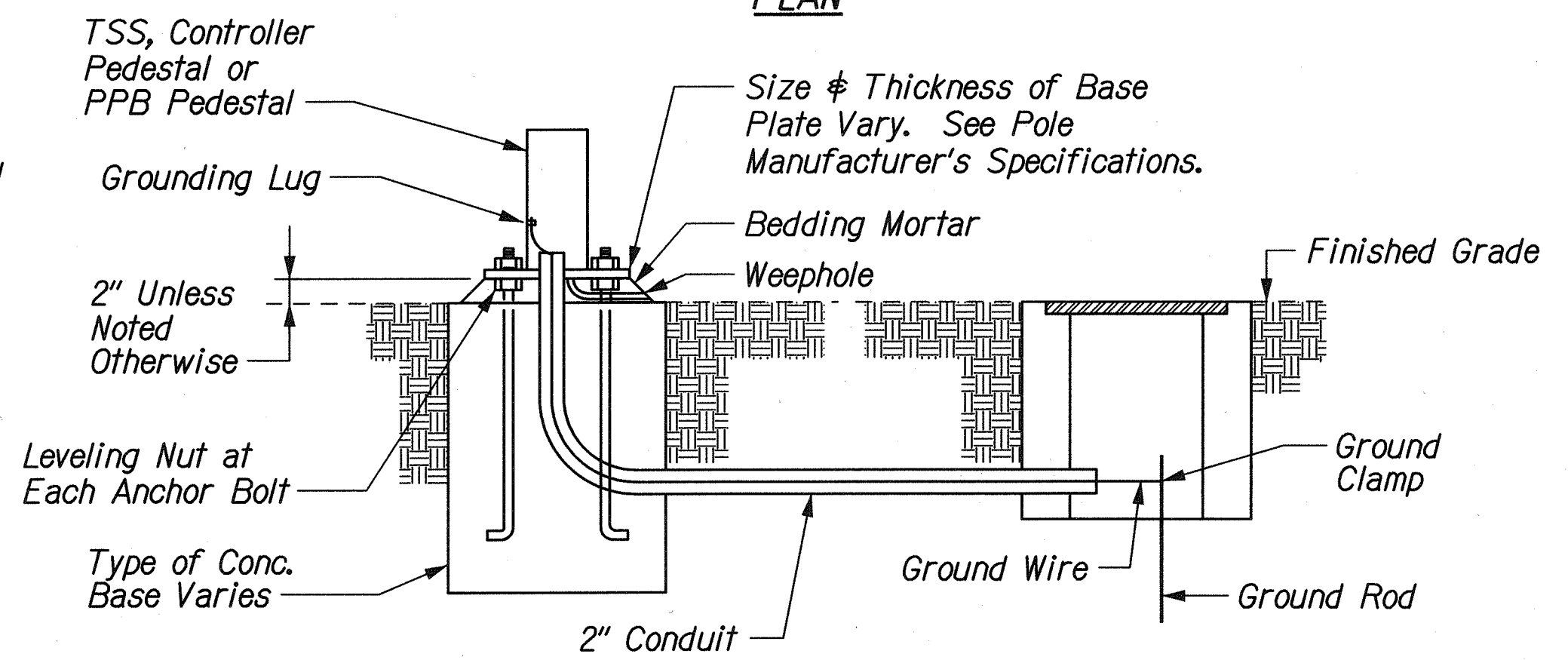
Typical Standard Designation: II - 25
Type Mast Arm Length

NOTES:

- Concrete shall be Class "A".
- Type "C" concrete base shall be used for Types II Traffic Signal Standards.
- Design Lateral Pressure: 1,500 PSF (Service Load).
- Conduit bend is incidental to concrete base.
- Reinforcing steel shall conform to ASTM A615, Grade 60.



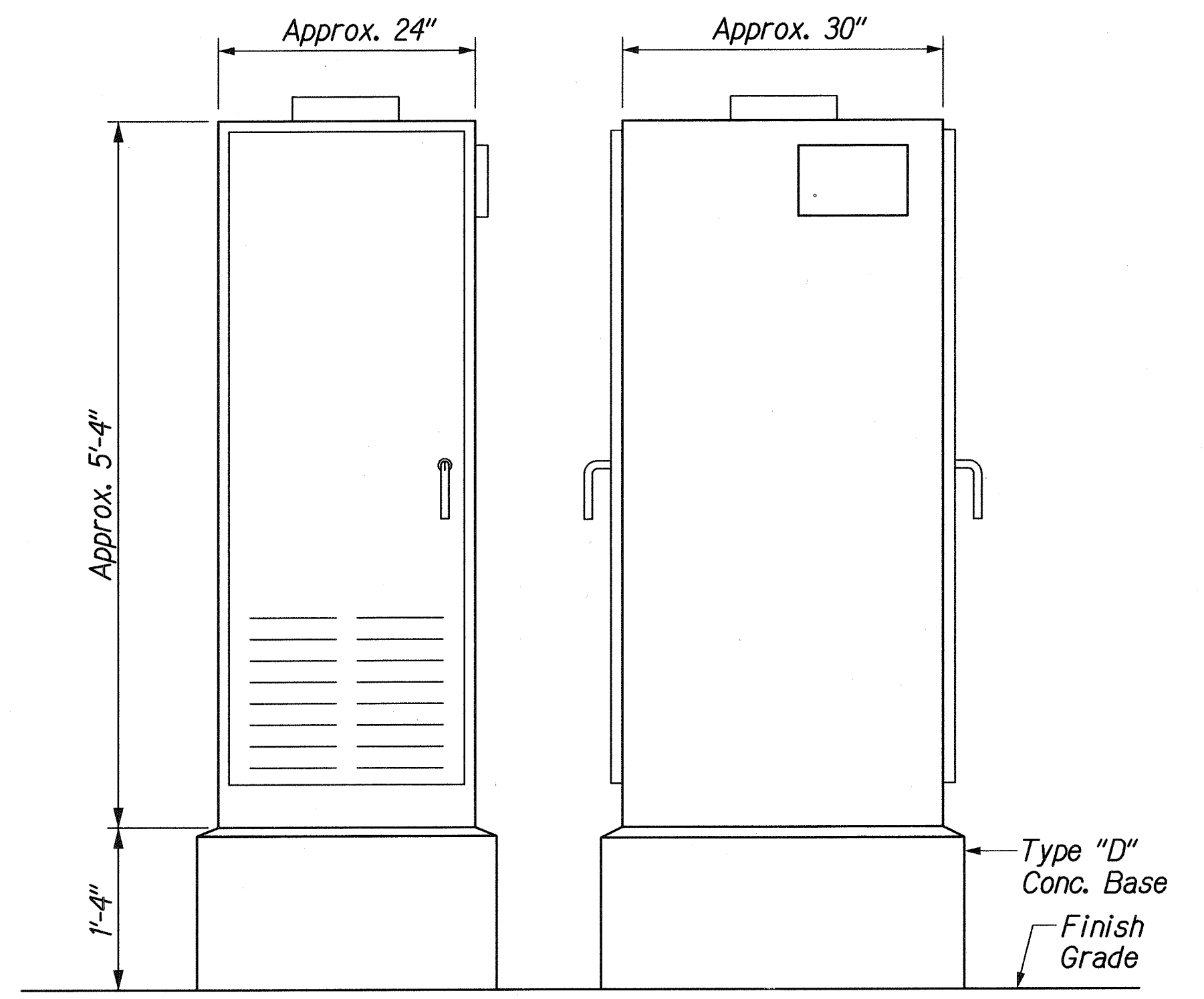
PLAN



SECTION

TYPICAL STANDARD AND PEDESTAL INSTALLATION

Scale: 1/2 inch = 1 foot 0 inch



FRONT VIEW

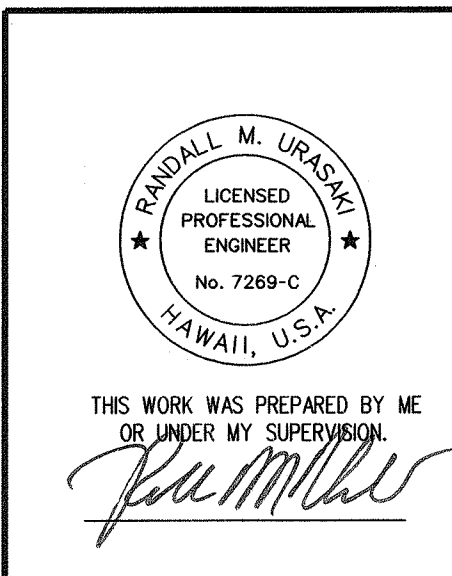
SIDE VIEW

TYPE 332A CABINET

Scale: 1 inch = 1 foot 0 inch

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

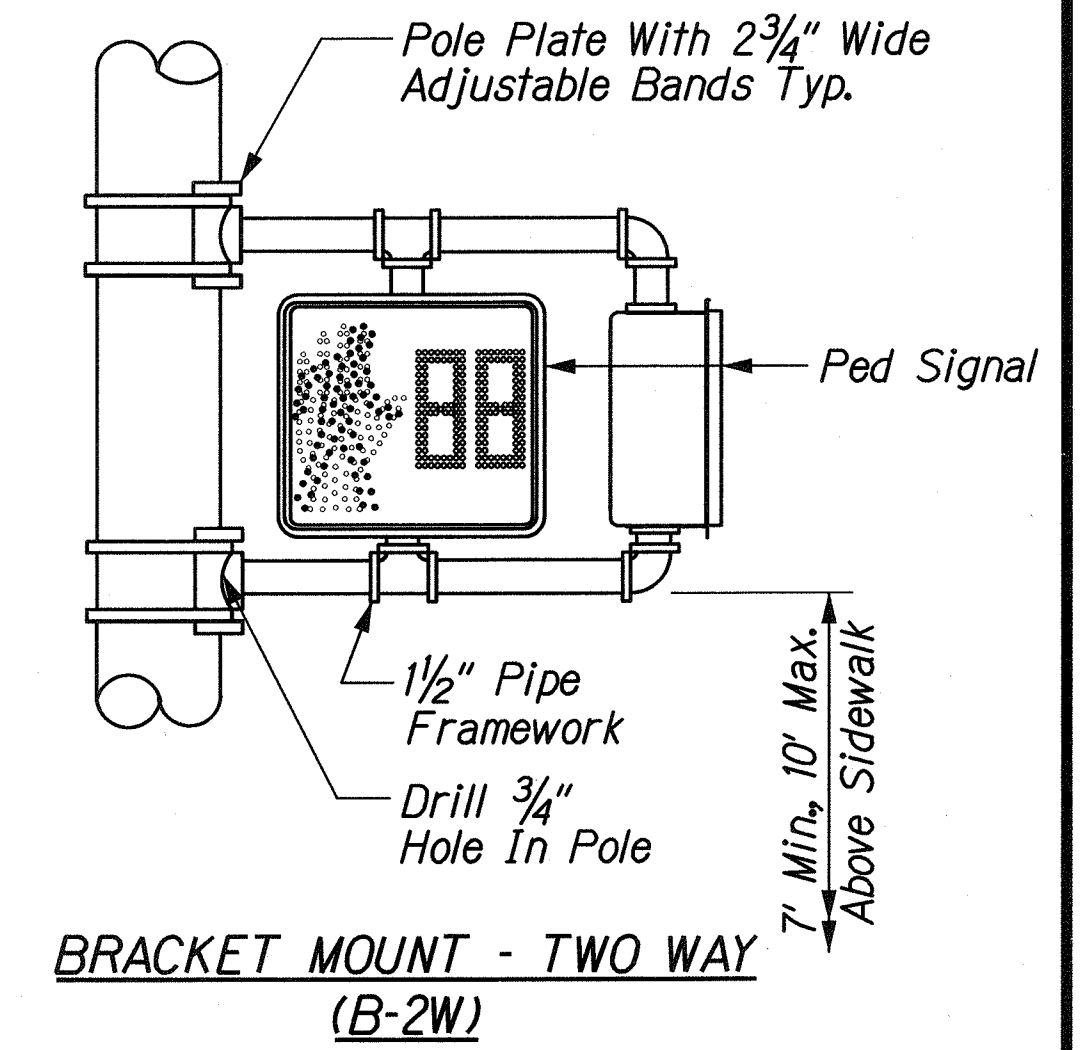
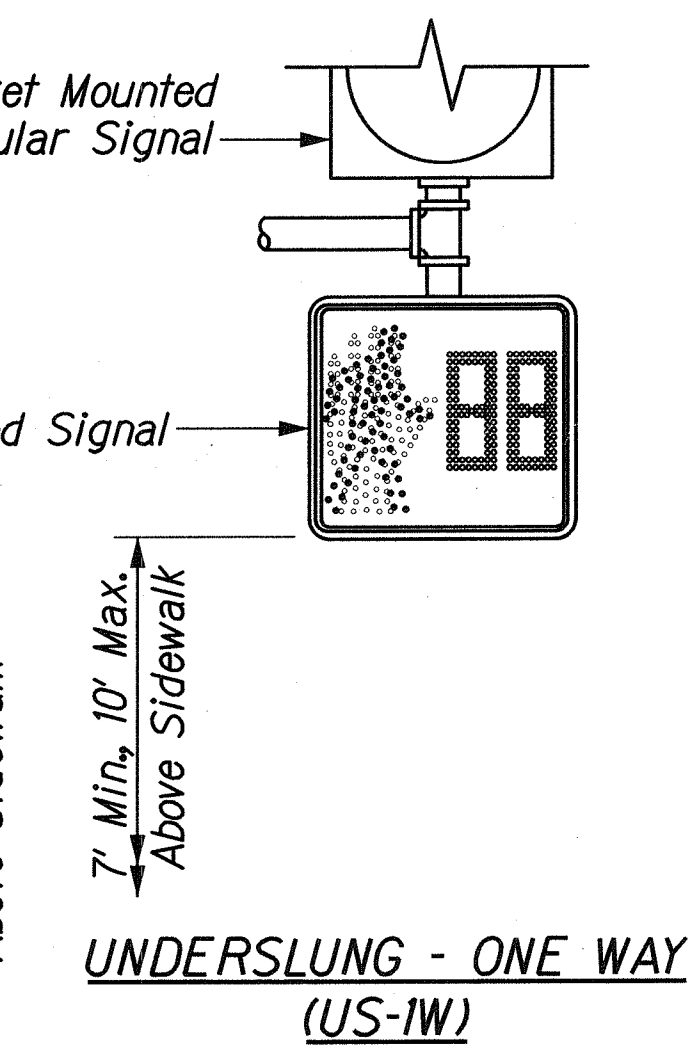
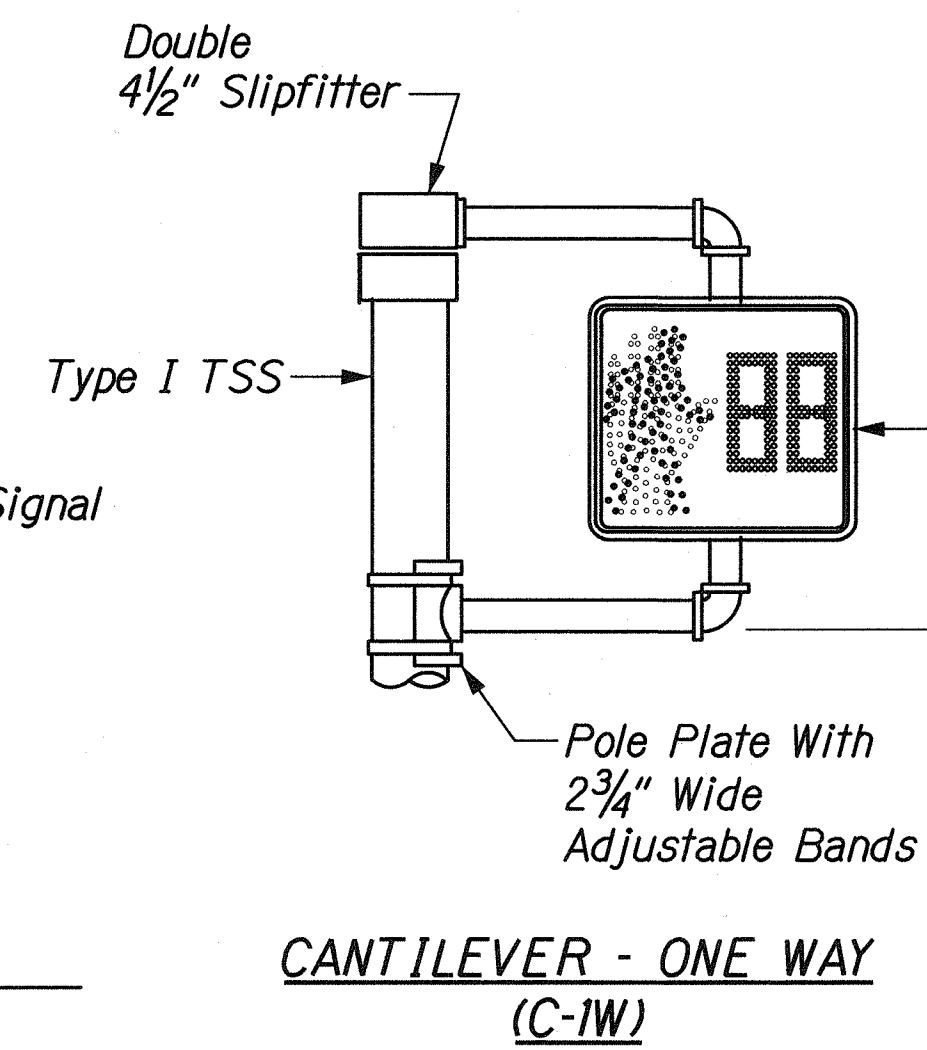
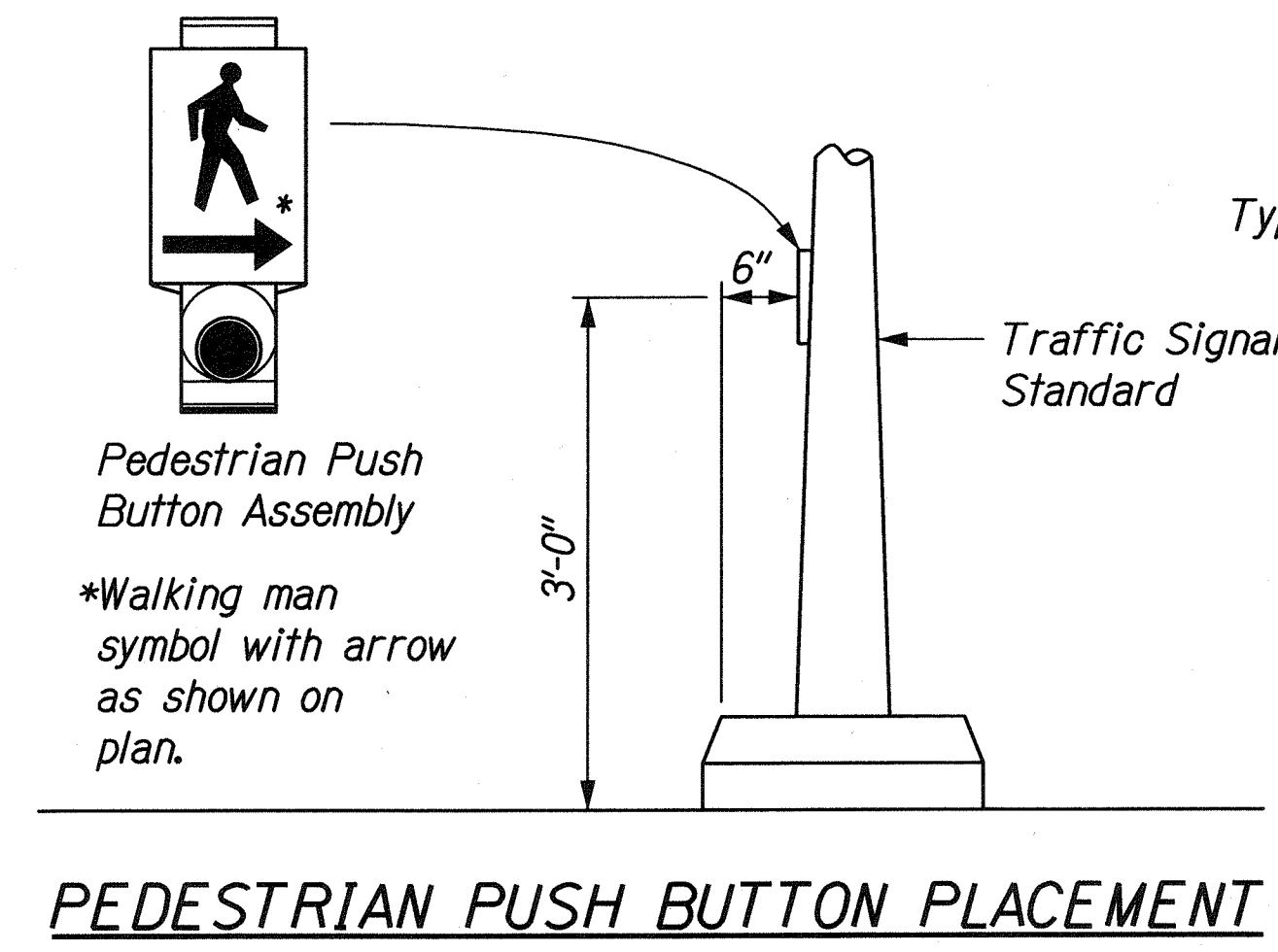
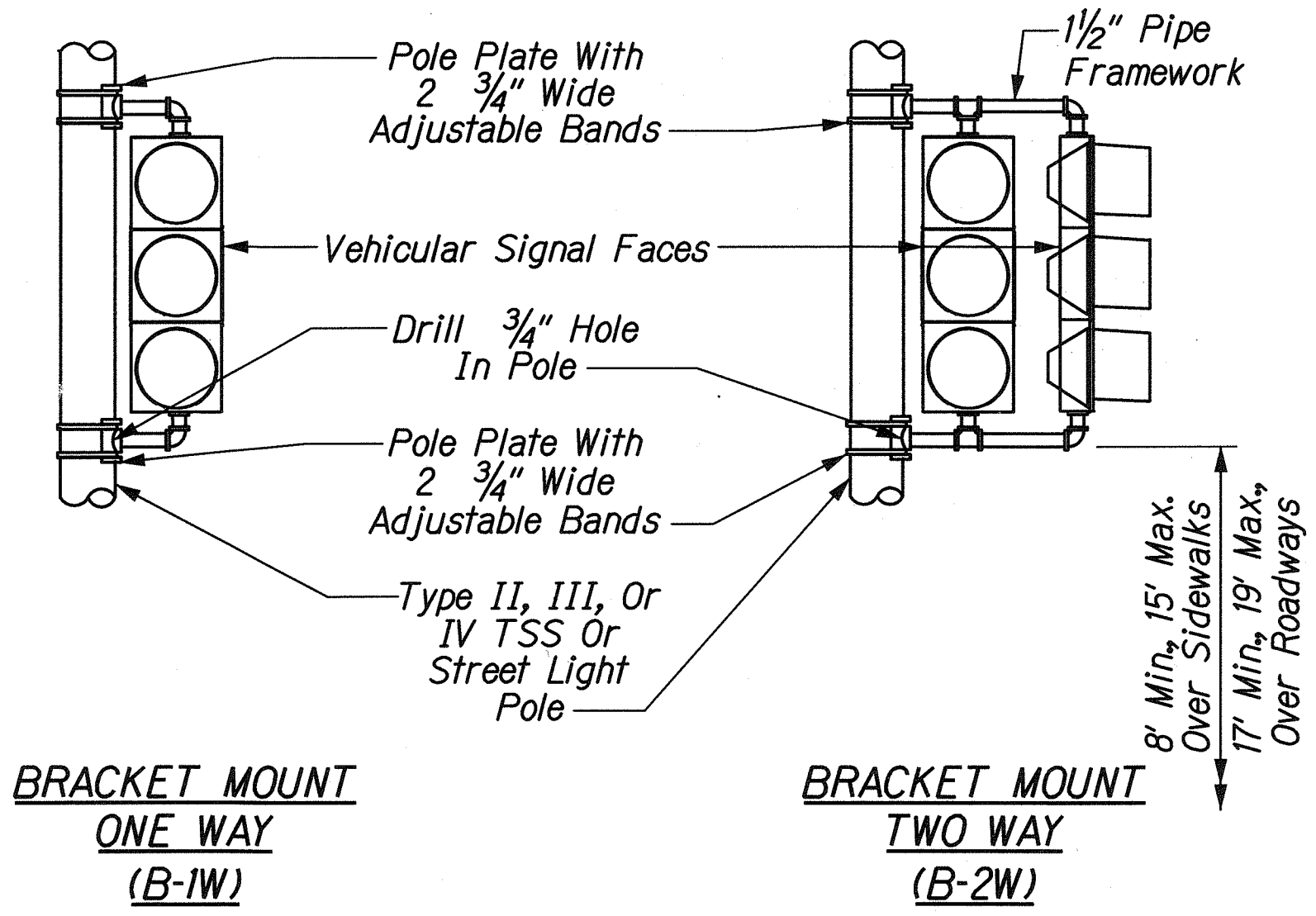
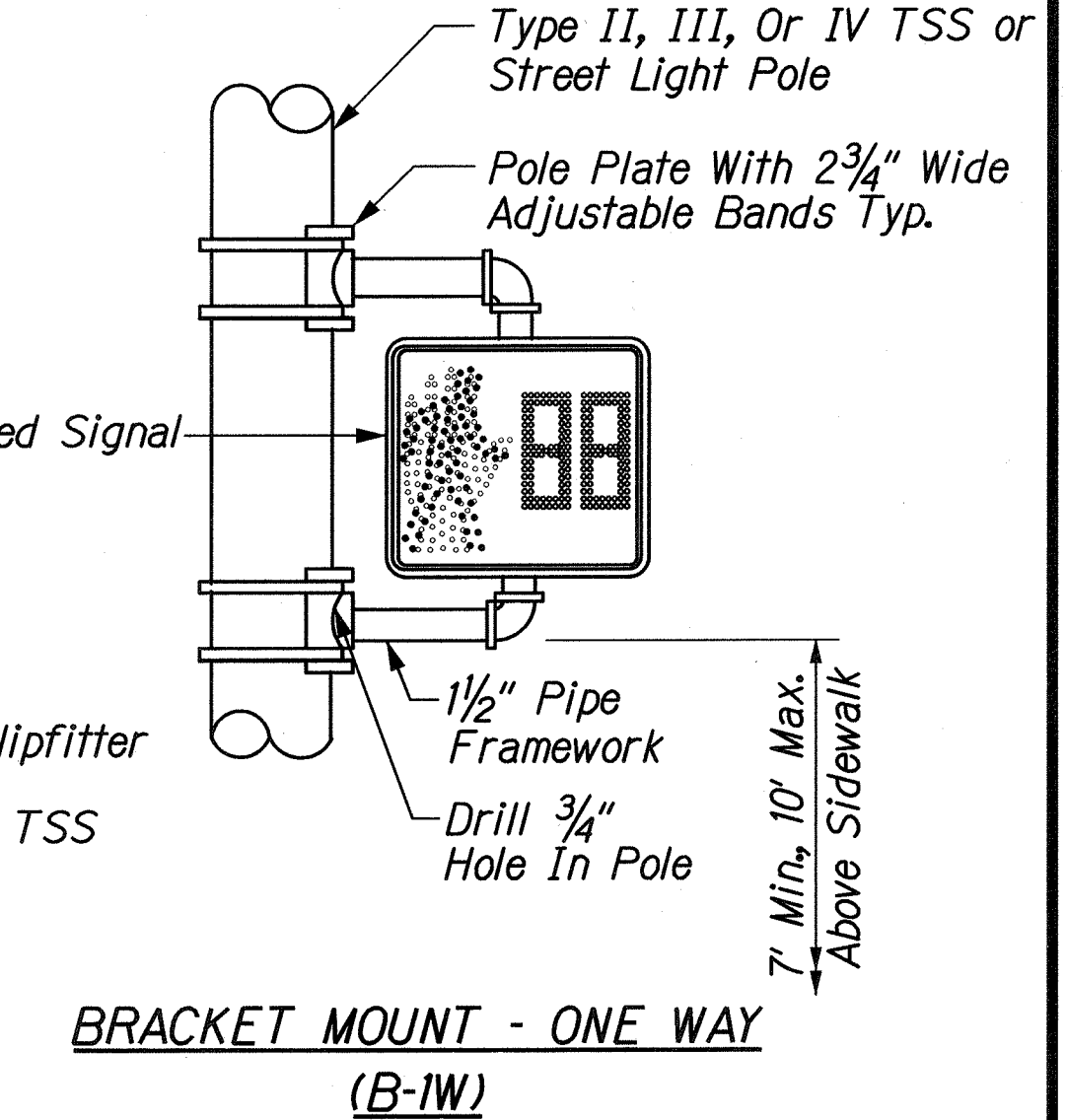
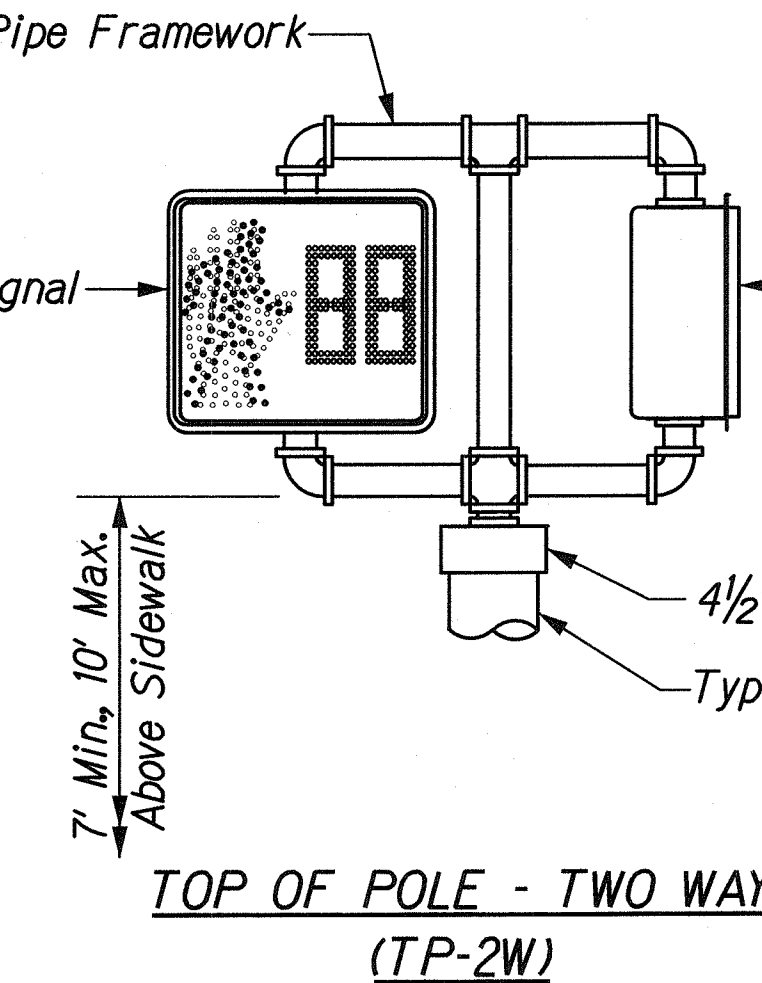
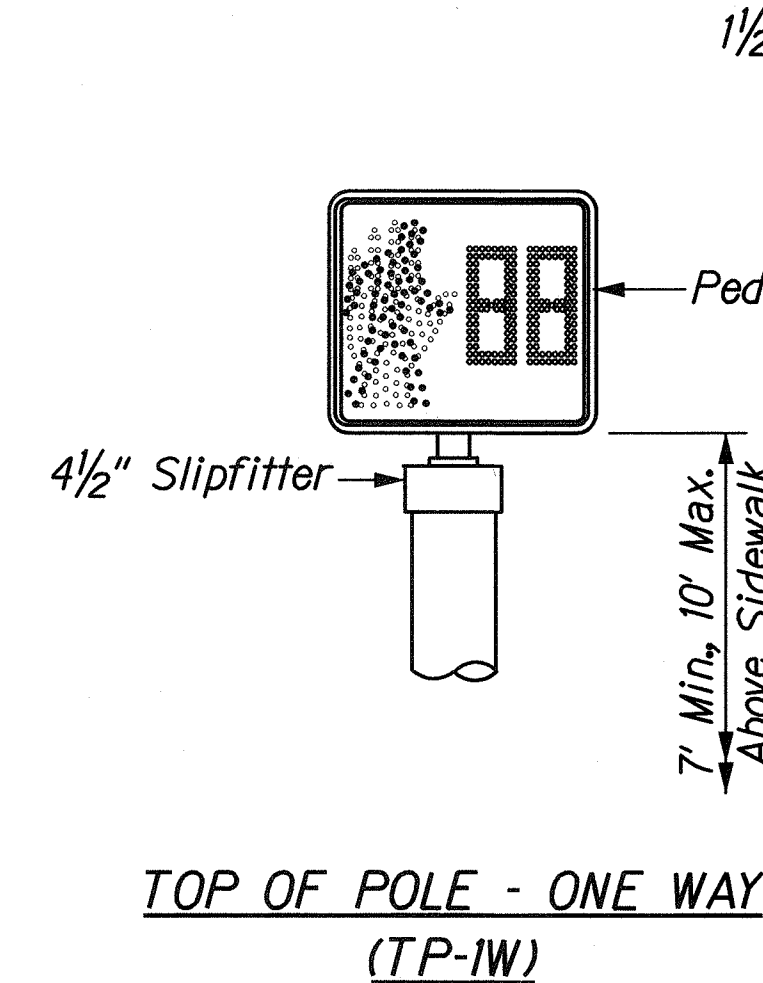
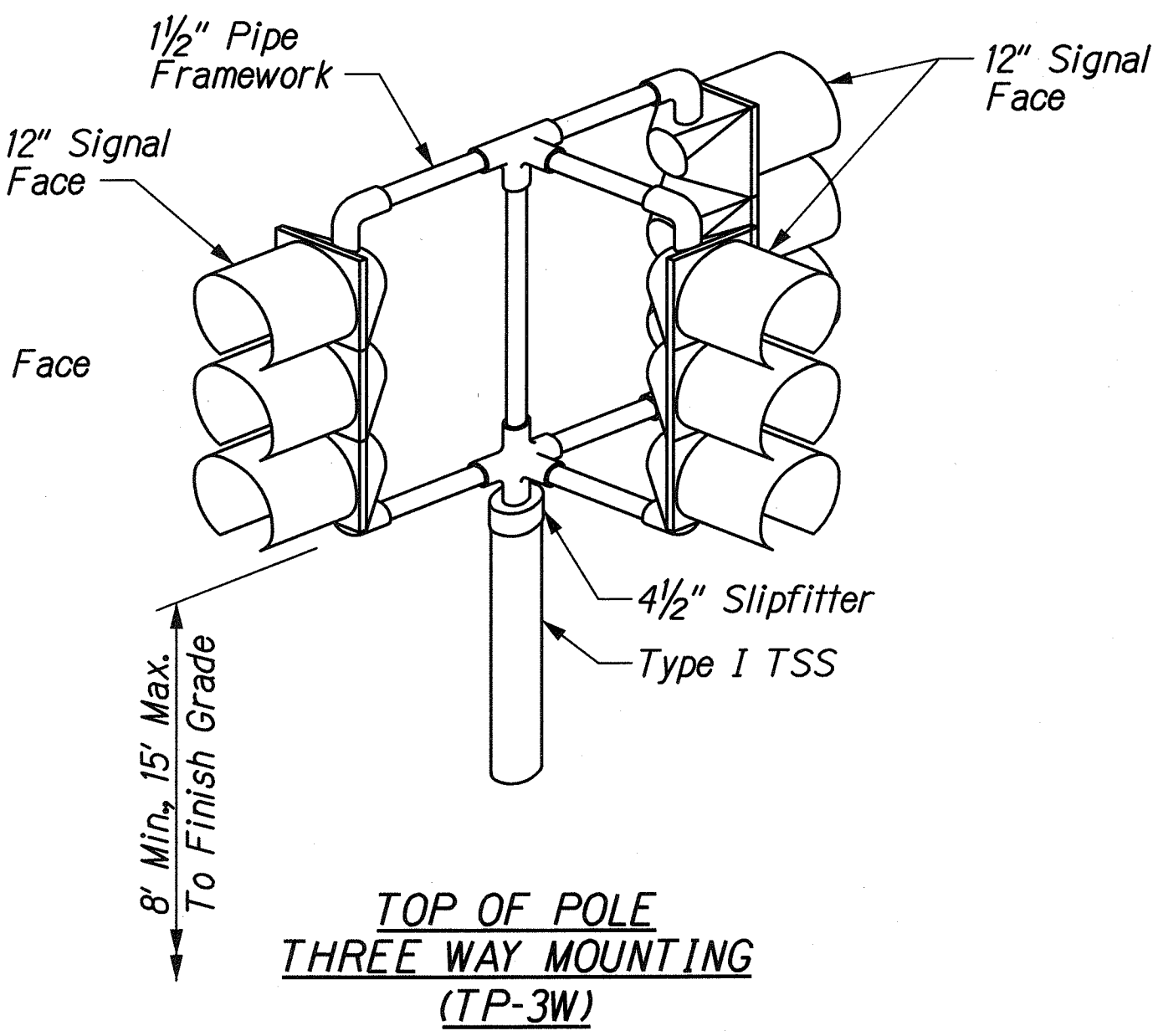
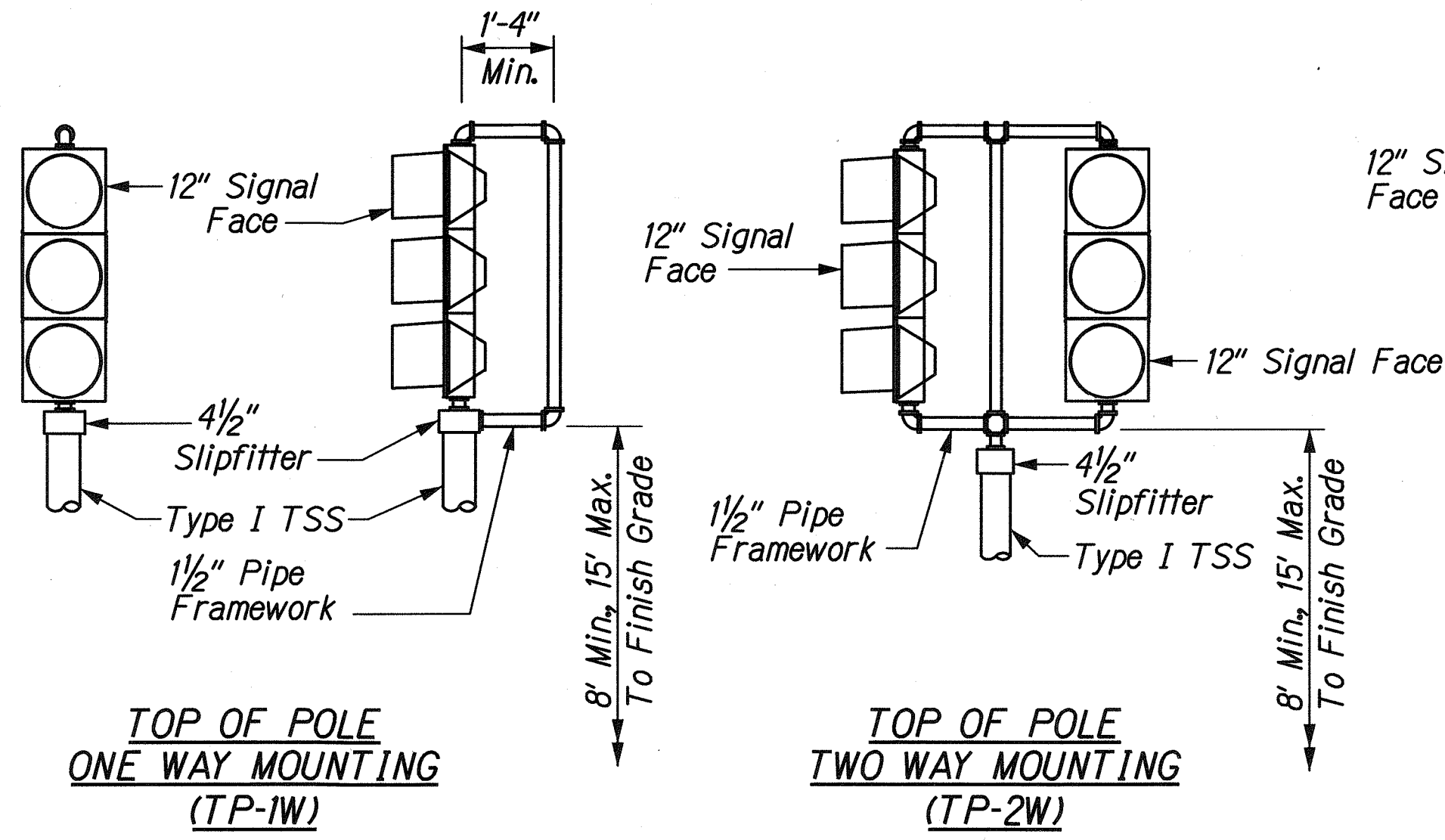
TRAFFIC SIGNAL PLAN
CABINET AND BASE DETAILS

FORT WEAVER ROAD WIDENING
VICINITY OF AAWA DRIVE TO GEIGER ROAD

Scale: As Shown Date: Sept. 20, 2007

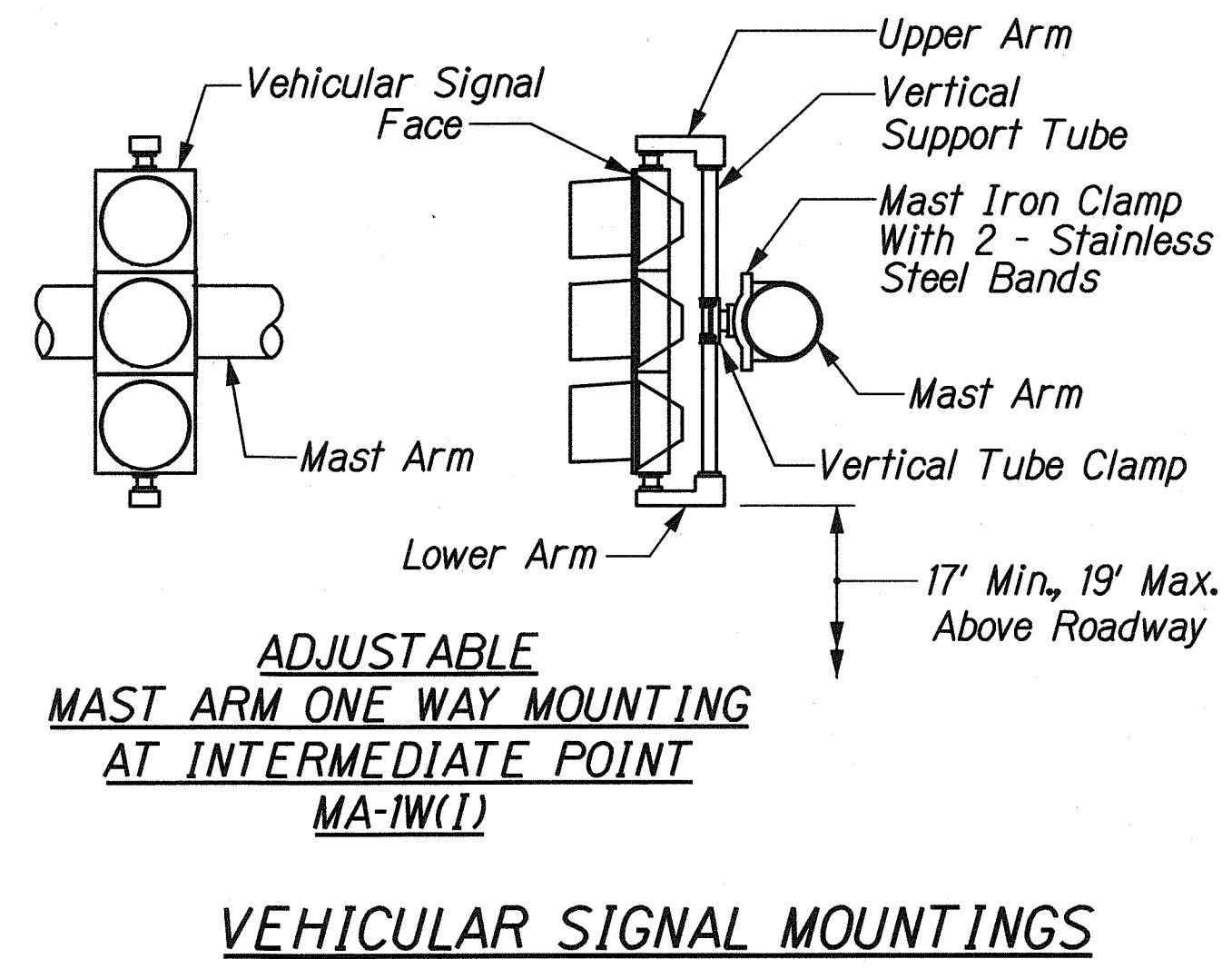
SHEET No. TSI-6 OF 9 SHEETS

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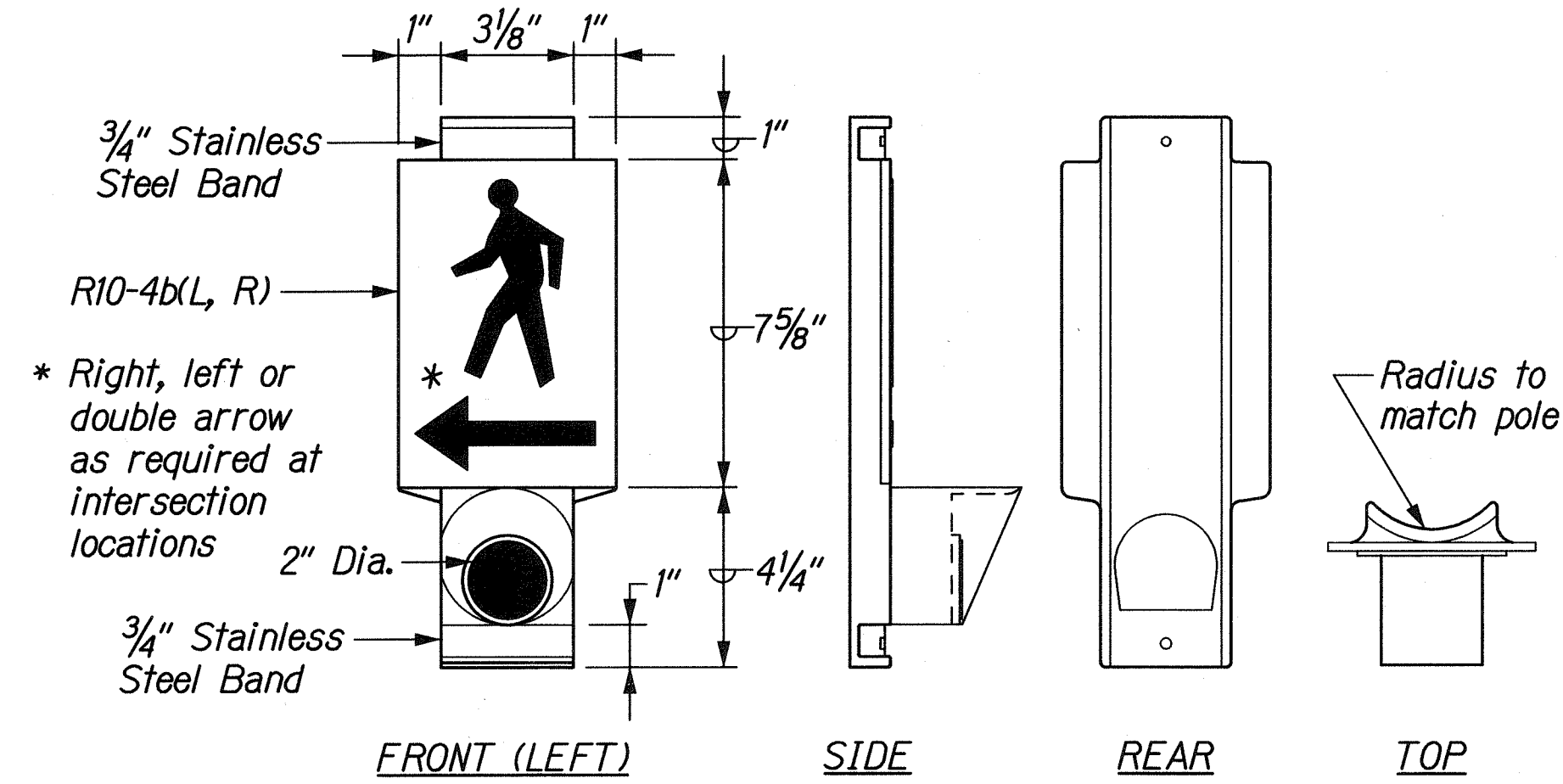


PEDESTRIAN SIGNAL MOUNTINGS

- NOTES:**
1. Stainless Steel Bands shall be 1/2" Wide X .050" thick, minimum. Tensile strength shall be 100,000 PSI minimum.
 2. Upper Arm, Lower Arm And Vertical Support Tube shall be of 356 Cast Aluminum.
 3. All Wiring Shall Be Concealed.
 4. Vertical Tube Clamp shall be of Malleable Iron, Grade 32510.
 5. All Aluminum Parts shall have an Alodine 1200 finish.



VEHICULAR SIGNAL MOUNTINGS



PEDESTRIAN PUSH BUTTON ASSEMBLY

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

**TRAFFIC SIGNAL PLAN
 MOUNTING BRACKET DETAILS**

FORT WEAVER ROAD WIDENING
 VICINITY OF AAWA DRIVE TO GEIGER ROAD

Scale: None Date: Sept. 20, 2007

SHEET No. TSI-7 OF 9 SHEETS

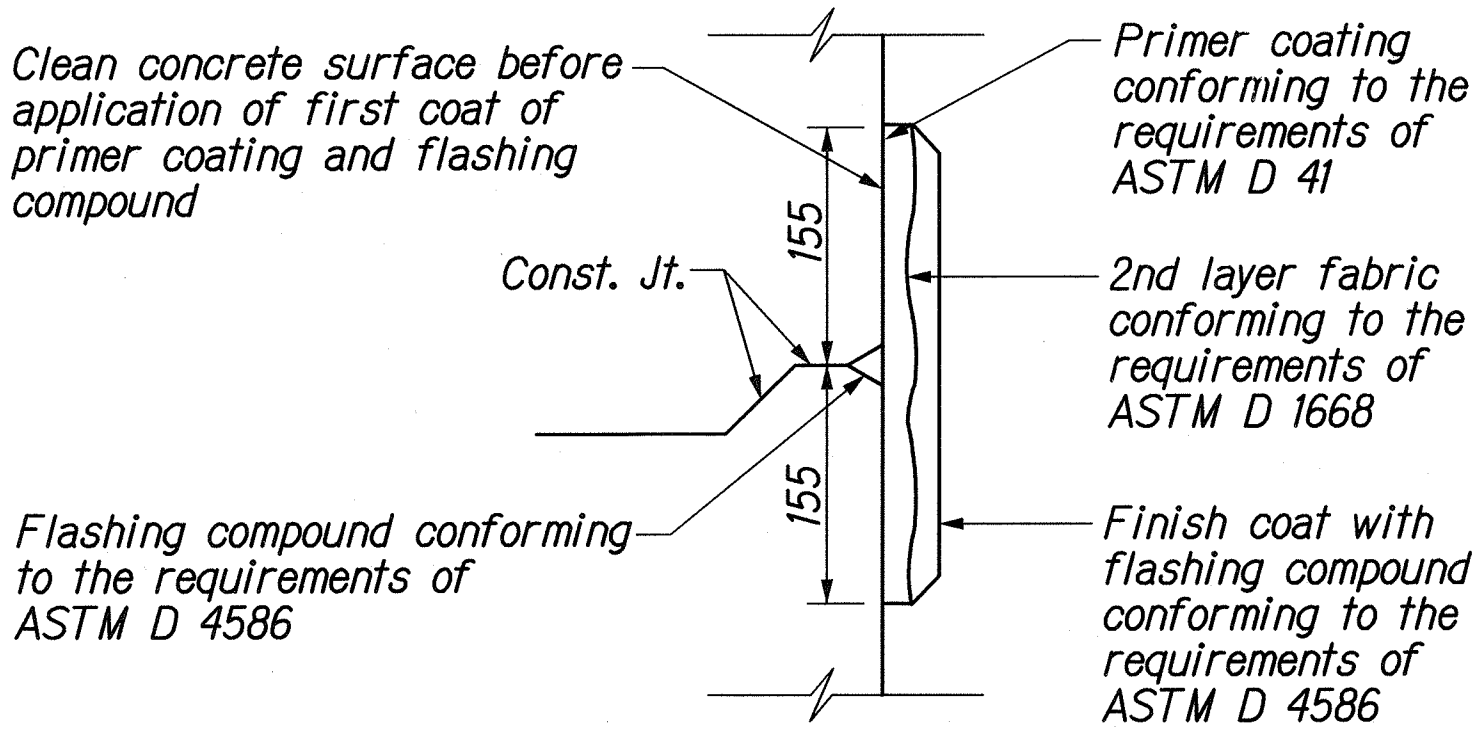
DESIGNED BY	DATE
CHECKED BY	
NOTED BY	
ORIGINAL PLAN	

44 FORT WEAVER ROAD TSP/TS-DET3.dgn

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-076-1(9)	2006	91	160

GENERAL NOTES:

1. Provide a minimum of one 16ø x 2.5m Copperweld Ground Rod in each pullbox. When directed by the Traffic Signal Inspector/Engineer, install additional Ground Rods. Cost of Ground Rods shall be incidental to the pullboxes.
2. All pre-cast concrete pullboxes shall be manufactured in two pieces.
3. The pullbox with cover shall be capable of supporting an MS 18 Loading.
4. The maximum weight of the pullbox cover shall not exceed 27 kilograms.
5. The openings for the conduits on all pullboxes shall be pre-cast concrete knockouts.
6. After installing the conduits in the openings of the pullboxes, the Contractor shall fill the excess opening in the pre-cast knockouts with concrete mortar.
7. Prior to installing the pullboxes, the Contractor shall level the bottom of the trench and achieve a minimum of 95% relative compaction of the bottom of the trench.
8. All concrete shall be Class A (25MPa, min.)
9. Rebars shall be Grade 300 and all lapped splices shall be 360mm minimum.
10. The #57 or #67 size aggregate shall conform to latest version of AASHTO M43 (ASTM D 448).
11. Type "C" Pullbox shall be installed in a location protected from vehicular traffic (i.e. raised sidewalk, behind A.C. curbs, traffic signal standard or pipe guards).



TYPICAL FLASHING COMPOUND WATERPROOFING DETAILS

Not to Scale

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

TRAFFIC SIGNAL PLAN

PULLBOX AND COVER DETAILS

FORT WEAVER ROAD WIDENING

VICINITY OF AAWA DRIVE TO GEIGER ROAD

Scale: As Shown

Date: Sept. 20, 2007

PAUL M. M. URASAKI

LICENSED PROFESSIONAL ENGINEER

No. 7269-C

HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME

UNDER MY SUPERVISION

Paul M. M. Urasaki

SECTION A-A

TYPE "A" PULLBOX (Old Type "B")

Scale: 1 : 100

SECTION A-A

TYPE "B" PULLBOX (Old Type "C")

Scale: 1 : 100

SECTION A-A

TYPE "C" PULLBOX (Old Type "D")

Scale: 1 : 100

Non Skid Surface

600

450

Symbol M (Hard Metric) Same Size as Mfr. Logo

Lift Slot 10 x 50

MANUFACTURER'S LOGO

TRAFFIC SIGNAL or HWY LIGHTING as specified

600

594

50

3

ELEVATION

POLYMER CONCRETE COVER

Not to Scale

Slope 1:1

Flashing compound waterproofing of back face of walls only

TYPICAL CONSTRUCTION JOINT DETAIL

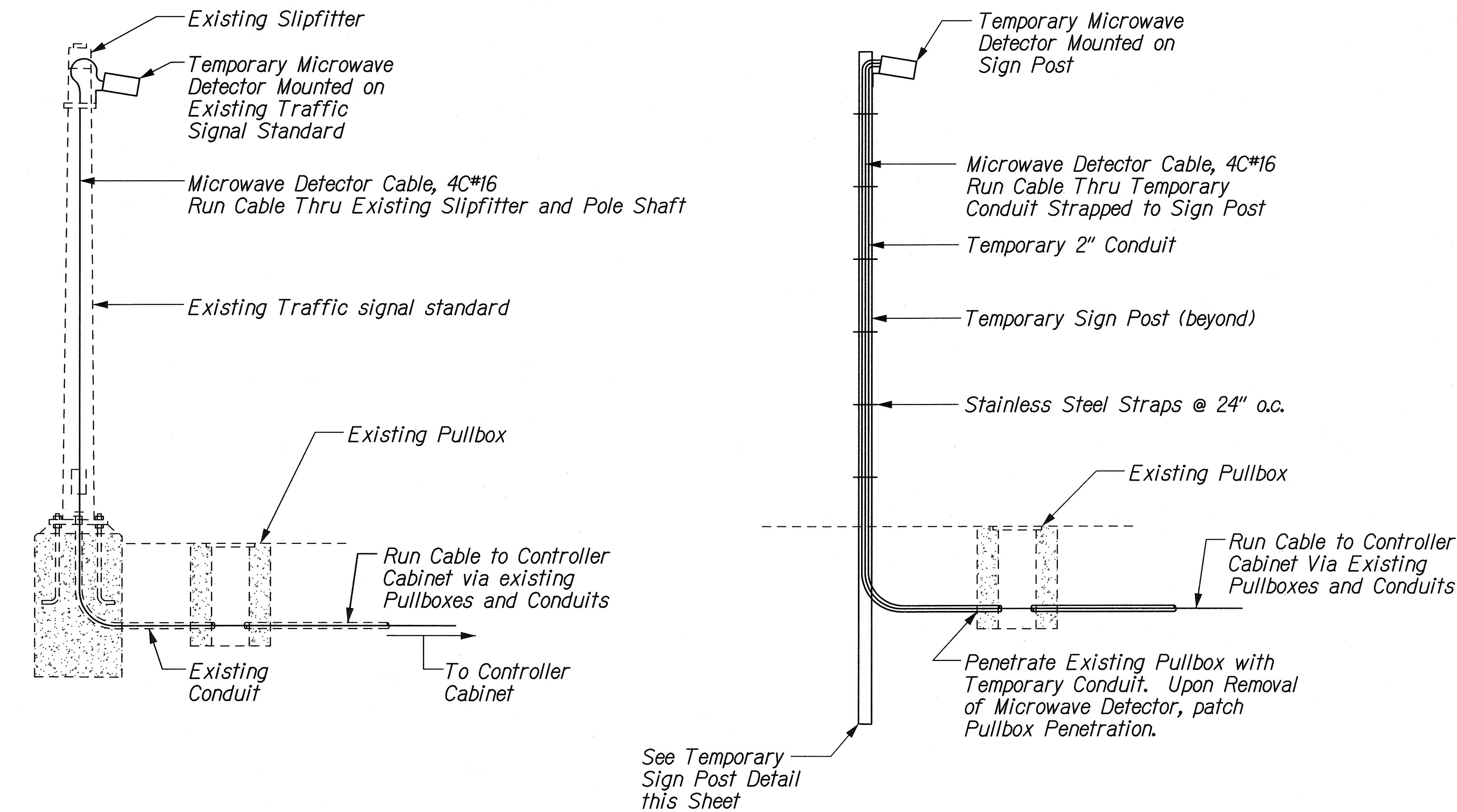
Not to Scale

DATE	_____
DESIGNED BY	_____
TRACED BY	_____
NOTE BOOK	_____
QUANTITIES BY	_____
CHECKED BY	_____
ORIGINAL PLAN	_____

J:\FORT WEAVER ROAD\TSP\TSP-DET-4.dgn

91

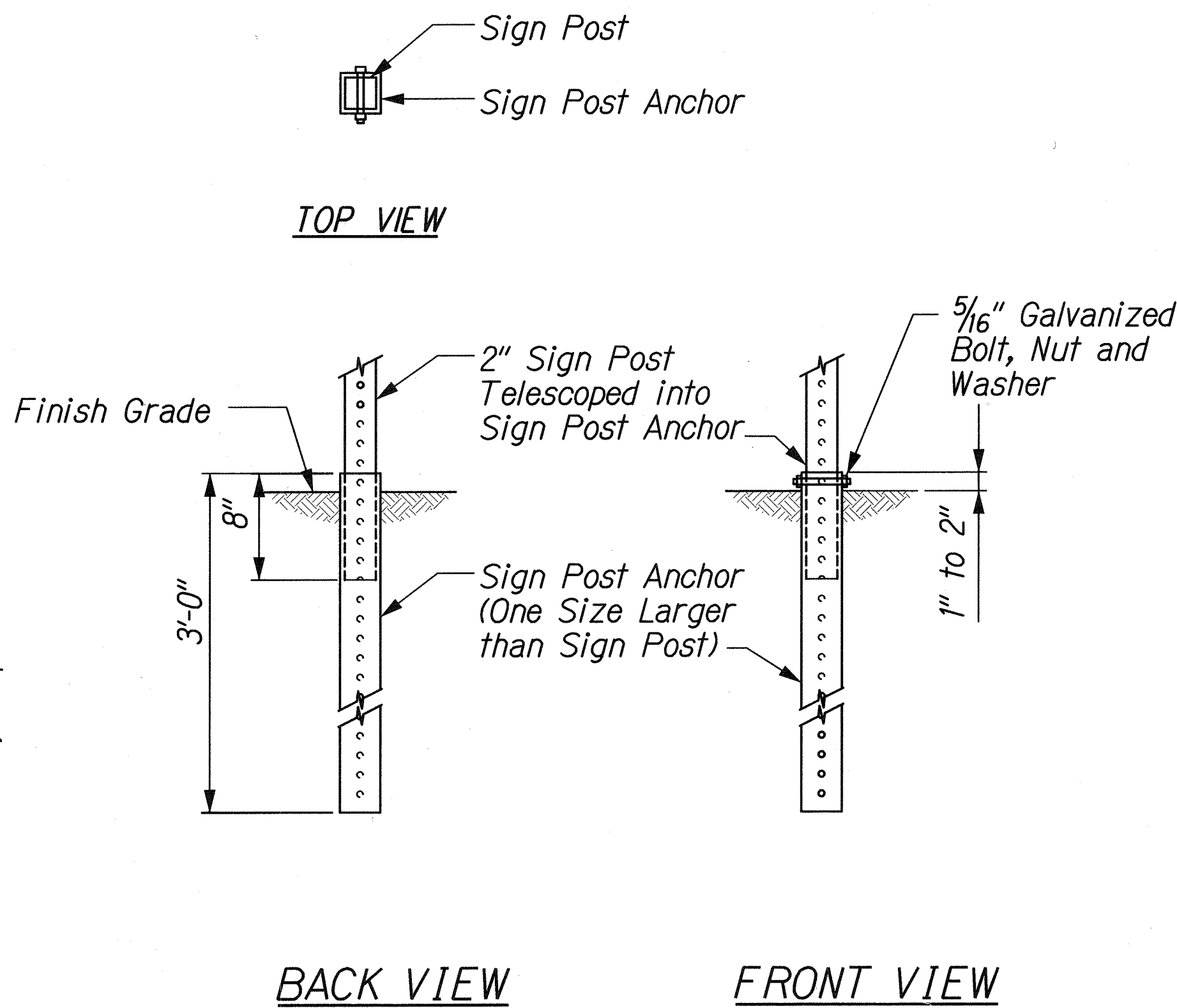
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-076-1(9)	2006	92	160



AT EXISTING TRAFFIC SIGNAL STANDARD

AT TEMPORARY SIGN POST

TEMPORARY MICROWAVE DETECTOR DETAIL
Not to Scale



TEMPORARY SIGN POST DETAIL
Not to Scale

NOTES:

1. Microwave Detector shall be operational before existing Loop Detectors are deactivated.
2. Remove Microwave Detector and all associated cables after new loop detectors are installed and operational.

ORIGINAL PLAN	DATE
NOTES BOOK	
DESIGNED BY	
CHECKED BY	
DATE	

64 FORT WEAVER ROAD/PACKAGE/TS/TS-DET5.dgn

THIS WORK WAS PREPARED BY ME
OR UNDER MY SUPERVISION

R. M. Uraski

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**TRAFFIC SIGNAL PLAN
MICROWAVE DETECTOR DETAILS**

FORT WEAVER ROAD WIDENING
VICINITY OF AAWA DRIVE TO GEIGER ROAD

Scale: None Date: Sept. 20, 2007